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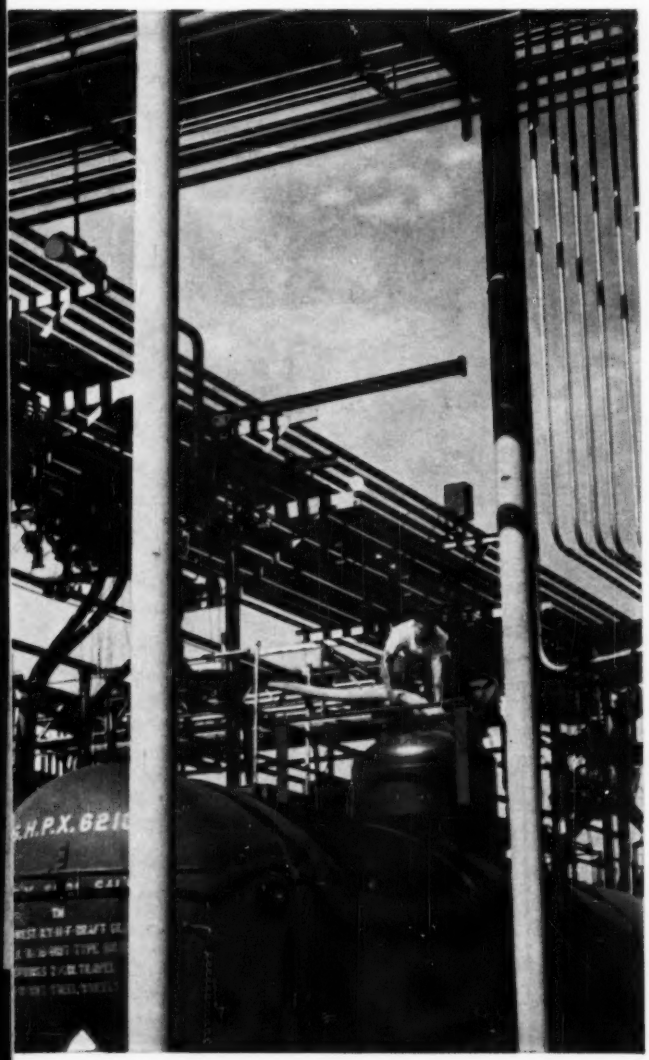
Chemical Week



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January 2, 1960

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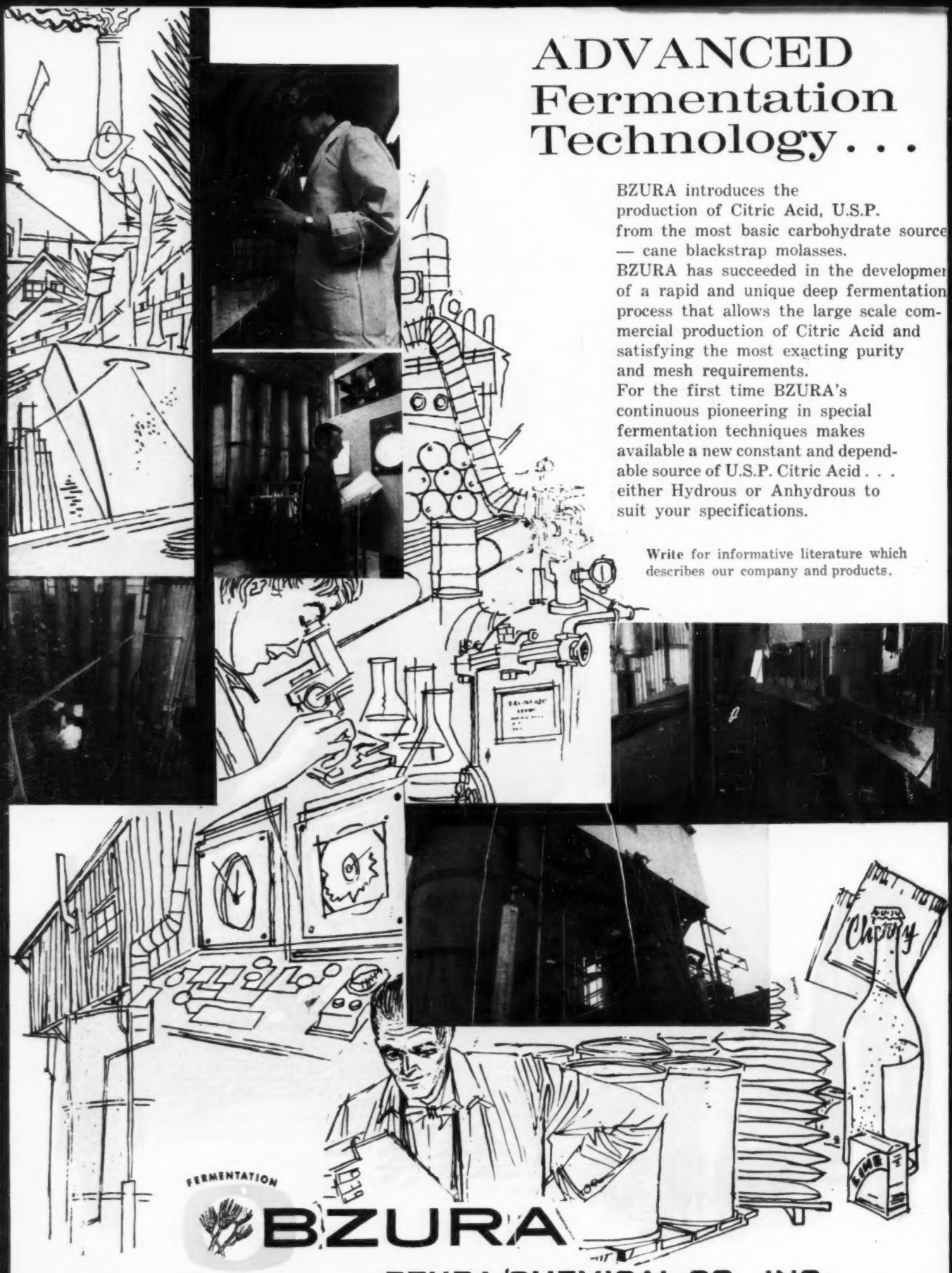

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Chemical Week

TOP OF THE WEEK

JANUARY 2, 1960

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- **Profit sharing gains favor with CPI management** as way to lessen impact of automation on worker pay .....**p. 31**
- **Identification of fibers used in filter cloths**—now required by law —could simplify task of purchasers .....**p. 41**

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CIL's Allen touts higher tariffs for Canada; bolder export policy; "realistic" investments by Canadians.

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15 New African transactions: Allied Chemical lines up chrome ore supply; American Potash & Chemical deals for lithium ore.

15 Industrial Rayon's diversification drive—thwarted last year by caprolactam project failure—reappears in plans for merger with Texas Butadiene.

16 Dayton Rubber looks to plastics and chemicals venture as basis for challenge to rubber industry leaders.

16 U.S. producers sell uranium metal and oxide to Britain and Japan—firm evidence that U.S. uranium makers can compete for world markets.

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COVER PHOTO COURTESY OF U. S. INDUSTRIAL CHEMICALS CO.

45,016 copies of this issue printed

Vol. 86
No. 1

Chemical Week is published weekly and copyrighted © 1959 by McGraw-Hill Publishing Co., Inc., 330 W. 42nd St., New York 36, N. Y. Place of publication: 3rd and Hunting Park Ave., Philadelphia 40, Pa. Second-class postage paid at Philadelphia. Subscription: $3 year in U.S.A. Send subscription correspondence and change of address to Fulfillment Manager, Chemical Week. Please see page 6 for subscription requirements.

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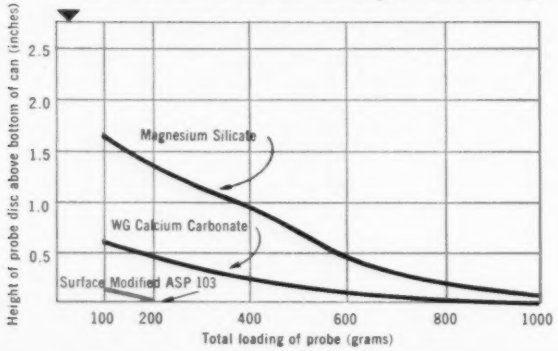
news briefs...

ON THE CREATIVE USE OF M&C PROCESS MATERIALS

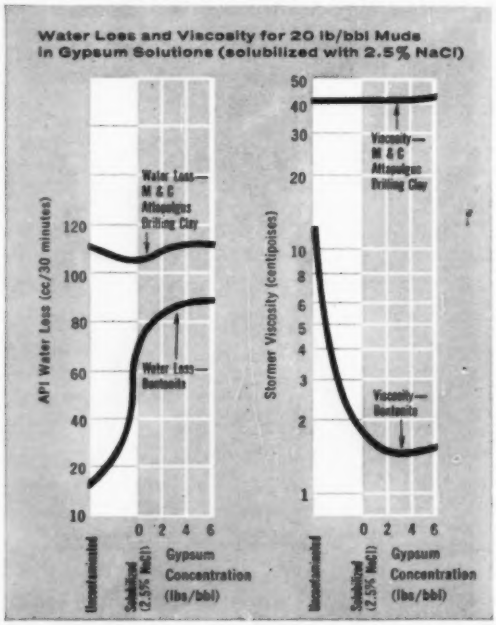
Results of Patton Pigment Settling Gauge tests on three formulations.‡ Each formulation was ground 5 hours and set on the shelf for 35 days. Then the settling characteristics were measured. Interpretation of results: the *higher* the reading, the *more* settling and the *harder* the body of settled pigment. In the ASP 103 formulation, the weighted probe went completely through the paint to the bottom of the can with minimum weight, in minimum time.



*Paint Makers: get fine grind quickly, superior suspension with Surface Modified ASP® extender pigments

Required fineness of grind in shortest time, long shelf life are assured for organic surface coating systems using M&C's Surface Modified ASP 103 . . . graphs present proof. Other benefits: stability, weatherability, color integrity—ASP's are water-washed to uniform particle size and shape, virtual chemical inertness. There's much more to the role of ASP's in surface coatings... this is a *starred* item... use the coupon.

Patton Pigment Settling Gauge measures settling characteristics of paints. A weighted probe passes down through paint in quart can, at half-minute intervals distance above bottom is read and load increased. Readings provide a profile of settled pigment.



Oil Well Drillers: higher yields without costly treatment when using M&C's improved Attapulgus Drilling Clay

Gyp, salt, oil emulsion, and completion muds—M&C's Attapulgus Drilling Clay is lower-cost than bentonite in just about any drilling mud. Why? *Substantially higher yields, and continued stability in the presence of field contaminants* without requiring costly chemical treatment. Graph shows evidence of comparative performances in gyp solutions. Viscosity and water loss rate of the Attapulgus Drilling Clay suspension is practically unchanged, from initial make-up in fresh water throughout continued build-up of gypsum concentration. However, the bentonite suspension solution shows a steady loss in viscosity and increase of water loss rate. Get the rest of the story on M&C's improved Attapulgus Drilling Clay . . . check the coupon . . . it will bring you TI-552, a 12-page bulletin just off the press.

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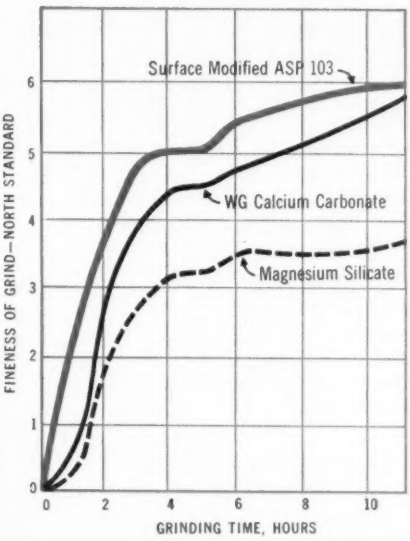
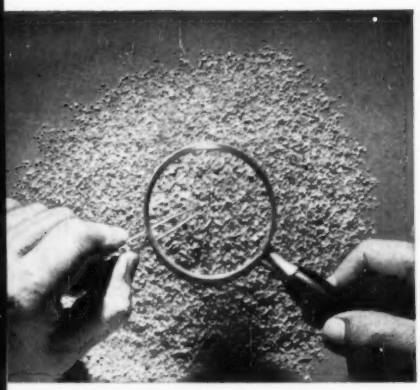
Comparison of rates for achieving fine grinds for three formulations.‡ Results with the ASP 103 formulation prove the case for achieving shorter grinding times, lower costs.



Isomerization—Porocel serves refiners' increasing needs for iso-butane

Alkylation demands more and more iso-butane. Isomerization of normal butane to iso-butane is supplying the needs—catalyzed by Porocel-supported aluminum chloride under proven processes. Easy-to-impregnate, economical Porocel brings to refiners other advantages: top hardness, high activity, uniform impregnation, inertness, long life. Check the coupon for data on Porocel natural bauxite, the highly active catalyst and catalyst carrier.

*Looking for surface area? Granular Attapulgus Clay warrants close inspection



"Selective thirsty-blotter action" describes the way M&C's Granular Attapulgus Clay works. This results from the unusual combination of characteristics given by nature to its source material, the mineral *attapulgite*. The ultimate particles are lath-shaped with diameters of 10 to 50 millimicrons. Processing and thermal activation produce Granular grades with a surface area of 125 m^2/gram in a minutely-porous crystalline structure . . . completely inorganic and essentially inert.

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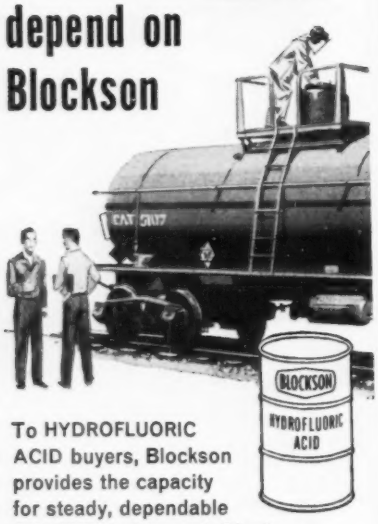

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JANUARY 2, 1960 **Vol. 86, No. 1**

Chemical Week (including Chemical Specialties and Chemical Industries) is published weekly by McGraw-Hill Publishing Co., James H. McGraw (1860-1948), founder. EXECUTIVE EDITORIAL, CIRCULATION and ADVERTISING OFFICES: McGRAW-HILL BUILDING, 330 West 42nd St., New York 36, N.Y. See panel below for directions regarding subscriptions or change of address. Donald C. McGraw, President; Joseph A. Gerardi, Executive Vice-President; L. Keith Goodrich, Vice-President and Treasurer; John J. Cooke, Secretary; Nelson Bond, President, Publications Division; Harry L. Waddell, Senior Vice-President; John R. Callaham, Vice-President and Editorial Director; Joseph H. Allen, Vice-President and Director of Advertising Sales; A. R. Venezian, Vice-President and Circulation Coordinator.

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THE BUSINESS MAGAZINE OF THE CHEMICAL PROCESS INDUSTRIES

VIEWPOINT

A "common market" for the U.S. and Canada? A study of this intriguing possibility was suggested by MCA Board Chairman John Connor, speaking to Canadian businessmen recently **(CW, Oct. 31 '59, p. 10).**
A contrasting Canadian view was expressed by CIL's Peter C. Allen, speaking to MCA. Allen, in reviewing Canadian chemical problems, advocated some tariff increases, a bolder export policy and a more realistic investment attitude at home. Highlights:

Mr. John T. Connor, when discussing the possible effect on us in North America of the European and other "common market" plans, suggested that Canada and the United States should work toward a mutual abolition of trade barriers of all kinds on chemicals. In such a way, he implied, the industries of both countries would be able to specialize in the chemicals for which they are best suited, with benefits to producers and consumers in each country.

Study would be needed to judge whether the hoped-for benefits would actually be achieved and, if so, to what extent they would be offset by the very considerable industrial and social disruption involved.

No nation like Canada that wishes to maintain a reasonable standard of living can afford to rely for its livelihood on primary manufacture and the import of more sophisticated products from abroad, however friendly its foreign suppliers. Thus, Canada is unlikely to take any step that might lead to the surrender of its economic independence.

Perhaps, then, the key to the solution of Canada's economic problems is the raising of tariffs. Many of the Canadian chemical industry's difficulties are directly traceable to import competition, which supplies nearly a quarter of the Canadian chemical market, compared with only one-eightieth of the U.S. market.

I do not think the Canadian chemical industry can expect special consideration in the form of major tariff increases unless we are also prepared to accept similar increases for other industries.

In any case, I do not believe that a wholesale increase in tariffs is really the answer to our industry's major problems of inadequate and declining profit margins.

What then is the answer? If some of our difficulties arise from small internal markets, then naturally we should make efforts to find sales outside. The Canadian chemical industry now exports a healthy 16% of its total production, but much of this consists of two items—fertilizers and synthetic rubber—and less than a third of it goes to the U.S.

Contrary to opinion widely held in Canada, the U.S. tariff wall on chemicals is not always impossibly high. (There are, however, political and customs administration barriers that arise even when the tariff wall is apparently scalable.)

Perhaps there are opportunities in exports for our industry to tap the volume markets it so badly needs without opening the political "can of worms" presented by trade reciprocity.

Is it not at least possible that our industry has become so used to the idea of being competitive only within its own borders that, in considering a possible new product, it does not look as carefully as it should at export prospects? Or that the risks of export business are being allowed to obscure the sizable rewards to be obtained from such ventures?

Such exports could hardly hurt U.S. industry and, on balance, might even work to the advantage of those of you with plants north of the border. Even if we doubled our sales of chemicals to you, we would still supply much less than 1% of your chemical consumption.

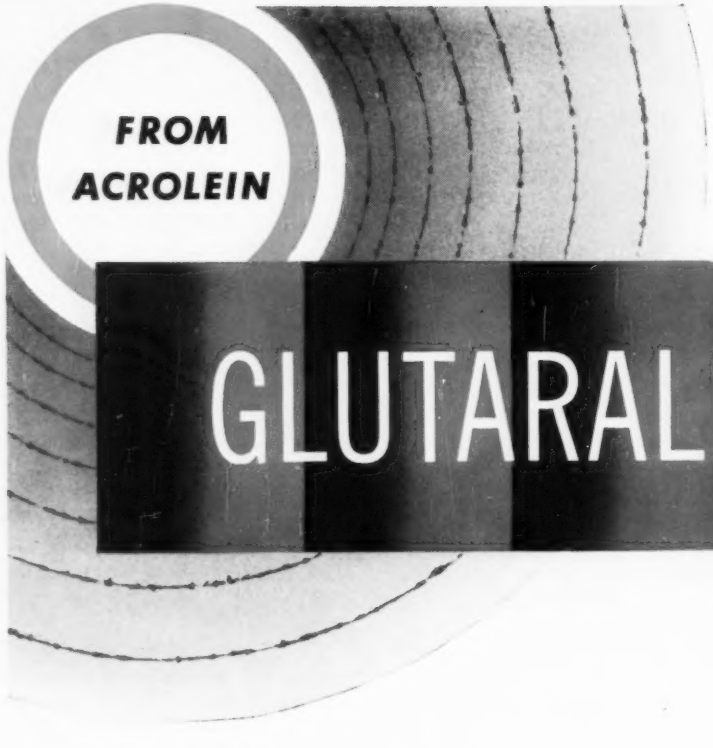
So much for exports.

Is there anything that can be done to relieve the situation in our own home market? I believe that there is, and that it lies simply in taking a more realistic view of the prospects for the Canadian economy. If we allow ourselves to be blinded by the brilliant prospects of a growing industry in a growing country and forget that our prospects, though bright, must be related to the time scale, we may find ourselves making some very dubious investment decisions. Much of the rate of growth of the market with us must be related to the number of Canadians.

The Canadian chemical industry is not and should not be considered as a miniature copy of its U.S. counterpart, but as an industry operating within confines of its own distinctive and limited market settings. Failure to recognize this basic truth leads, as I believe it has already done, to faulty market forecasting and to a duplication and triplication of effort from which neither consumers nor producers can benefit.

Competition is an excellent thing, in many important ways. But carried to an extreme in a small market like ours, it will not always bring with it —contrary to popular belief—lower prices to the consumer. Three or four small plants, each only partly used, require more depreciation to be set aside and more capital to be serviced than one or two working at a high rate. Three or four sales organizations to cover the same limited number of customers, the same huge geography, the same limited annual increase in the market, are inevitably more expensive than one or two. So in spite of all the advantages that competition brings, in better and more diverse products, for example, it will not necessarily bring lower prices in a small market. The reverse is quite likely.

There is no easy and obvious solution of the problems confronting the Canadian chemical industry. Whatever happens, the outcome will affect many U.S. companies, and indeed will not be a successful one if it fails to take your interests into account.



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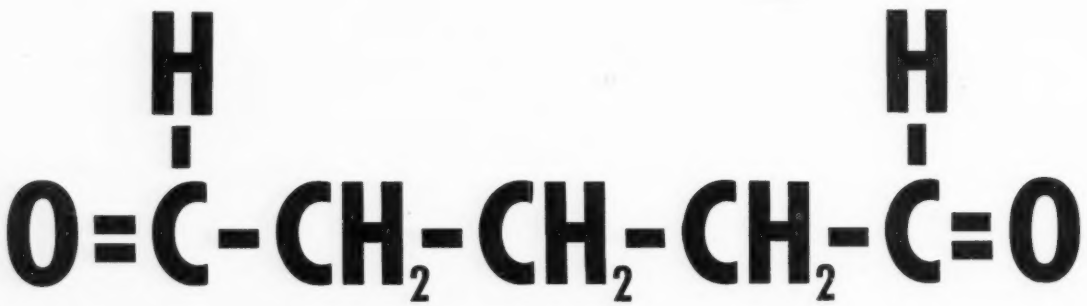

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Business
Newsletter

CHEMICAL WEEK
January 2, 1959

Economists are nearly unanimous in predicting a boom in first-half '60—provided that there's no big recurrence of the steel strike. CPI companies are setting their sails to run with the wind.

Look how CPI firms in the Buffalo-Niagara Falls area, for example, are priming for the anticipated boom:

• National Gypsum Co.—whose president Melvin Baker has gone on record with a forecast that first-half sales will be highest in company history—is pushing ahead on its $25-million expansion program for '60.

• Pratt & Lambert is rushing delivery of new automatic paint-mixing machines to distributors, banking on these devices to boost '60 sales despite an expected shrinkage in number of housing starts.

• Carborundum Co. says it will spend $8 million on modernizing and expanding its facilities in the area. The largest share will go to its Electro Minerals Division.

• Ashland Oil & Refining—which is planning to build a 50-million-lbs/year naphthalene and benzene plant at its Buffalo refinery (*CW Technology Newsletter, Nov. 21, '59*) is stressing petrochemicals in its research and development program. The company's financial report for the year ended Sept. 30, out last week, shows dollar-volume sales of specialty products and petrochemicals up 44% over '58. Over-all, sales mounted 7%, to $300.6 million, and net income rose about 40%, to $14.3 million.

•

Overseas, synthetic rubber is in for a big year. Total rubber consumption by non-Communist nations other than the U.S. is expected to mount 5%, to 1.63 million tons; and in many countries, there's a drive to produce more synthetic rubber at home to meet an increasing share of total rubber demand.

Look for Europe to be producing nearly half of its rubber requirements by '65, even though demand is rising as more vehicles come into use. Right now, Europe's synthetic output equals about 35% of its rubber requirements—most of the capacity having come onstream in the past two years.

But synthetic rubber capacity in other non-Communist nations is likely to rise even faster, moving from 17% of total rubber consumption in '58 to as high as 30% by '65. Sizable plant projects are under way in Brazil, Australia, and India, with several U.S. companies participating.

Next on the list may be South Africa, which ranks ninth in rubber consumption. The government's Synthetic Rubber Development Co. is working with private interests on plans for a 20,000-tons/year plant that now seems sure to get a go-ahead order.

Business
Newsletter

(Continued)

U.S. synthetic rubber exports to Japan may be largely replaced by Japanese production this year. That country's second producer—Nippon Synthetic Rubber—is slated to go onstream early this year. First-year output is pegged at 30,000 tons of SBR, with yearly 5,000-ton increments bringing total annual production up to 45,000 tons in '63. Last July, Japanese Geon Co.'s plant went onstream with a capacity of 8,400 tons/-year of SBR, high-styrene and NBR types. Goodyear, Esso Research, and Houdry supplied the know-how for the Nippon plant, while Geon's came from B. F. Goodrich Chemical.

A new carbon black plant will further boost the synthetic rubber industry in Japan. Showa Denko (which has a Phillips license) will finish the plant within two years. Phillips, incidentally, also supplied the know-how for Showa's new, 10,000-metric-tons/year polyethylene plant.

Total Japanese rubber imports this year are expected to be 176,780 tons, including 36,840 tons of synthetic, mostly from the U.S. and Canada. Consumption this year is estimated at 192,000 tons (about 17% synthetic), up 30% over '58. Consumption of synthetic is rising even faster, but probably not enough to help U.S. suppliers much over the long run.

•

A new proposal for handling U.S. business interests in Cuba has been made by Fidel Castro. The plan would work this way: a Cuban agency would market the nickel and cobalt of the U.S. plant at Nicaro and Freeport Sulphur's Moa Bay plant. The products would be sold for dollars and the money would be turned over to Freeport and the U.S. government in pesos, minus 5%. This is proposed as an alternative to a new 25% minerals export tax, announced earlier.

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More precise language in engineering and construction contracts is likely to follow the legal battle between Monsanto and M. W. Kellogg over the methanol plant Kellogg built for Monsanto and Heyden Newport in Texas City (*CW, April 11, '59, p. 24*). The $9.5-million damage suit was settled out of court last week. A critical point in the suit—what constitutes having know-how—could crop up again in cases where the contractor goes to a third party for technology, as often happens.

Monsanto had blamed the builder for the two and one-half-year delay in getting the plant started, charging that Kellogg fraudulently claimed to have the necessary know-how. Kellogg replied with a countersuit demanding arbitration, and asserted that Monsanto knew before the contract was signed that it planned to use technology from Imperial Chemical Industries and Linde Gesellschaft, along with a Linde low-temperature rectification unit. Kellogg pinned the blame for part of the trouble on Monsanto's alleged failure to supply the proper raw gas flow.

Terms of the settlement are secret. A brief joint statement says only that the differences have been "satisfactorily resolved," and that "Monsanto looks forward to continued use of the services of Kellogg and Linde."

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†Cohesive failure of resin. Adhesive bond intact.

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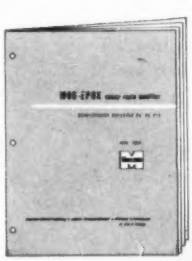

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Chemical Week

New Spurt in World Demand

When the "Gustav Keenig," a 222-ft. German tanker, slid down a slip into the Rhine River at Rendeburg a few days ago, it marked the launching of the world's first ship made almost entirely of aluminum, the first of a series of all-aluminum tankers that will ply the Rhine.

Simultaneously, Aluminium Ltd. boosted prices of aluminum ingots ¾¢/lb. in all markets outside the U.S. Within two days, U.S. producers —led by Aluminum Co. of America —had posted a similar hike in export prices. And they jacked up domestic ingot prices even further—by 1.3¢/lb. (*CW Market Newsletter, Dec. 26, '59*). After a suspense-filled three days, Aluminium Ltd. followed suit on its U.S. price.

While the launching of the *Gustav Keenig* and the round of price increases are not directly connected, both events underscore what many aluminum men have been saying lately: business is good, and they expect it to get better in markets around the world. And they're backing up this optimism with a raft of expansion and integration projects that are making aluminum one of the most "international" of industries.

"Corrective" Strengthening: When they hiked prices, the U.S. producers made it plain that they considered them no more than a belated "corrective" measure—a restoration to the 26¢/lb. price that prevailed for a year before Aluminium Ltd. initiated a 2¢/lb. cut in April '58. (The price moved back up 0.7¢/lb. four months later.)

The industry figures it can make its "correction" stick. Reason: it rides on the crest that was built up in boom year, '59. Despite the depressing effects of the steel strike during the latter part of last year, '59 shipments to consumers are expected to total about 2.45 million tons when all the figures are in—36% higher than in '58—and the highest tonnage sales since the 2.05 million tons shipped in '56. And primary production last year hit a record-breaking 1.95 million tons, up 25% over '58.

And—barring an unexpected slump in the general economy—U.S. producers expect '60 will be an even bigger year.

Reynolds Metals is probably the most optimistic of the big U.S. producers. It expects shipments will surpass the '59 level by 10%, possibly 20%. Alcoa expects a 10-15% increase in shipments, with heavy inventories feeding an even greater increase in actual consumption.

Inroads and Advances: Part of aluminum's upsurge reflects the swing of business activity in general. But producers emphasize that the metal is steadily wedging its way into new markets.

One industry estimate reports these sales gains in '59 for housing and other major use areas: building products, up 40%; transportation uses, up 35%; packaging, up 50%. And the industry expects to continue making inroads into the automotive, can and packaging markets.

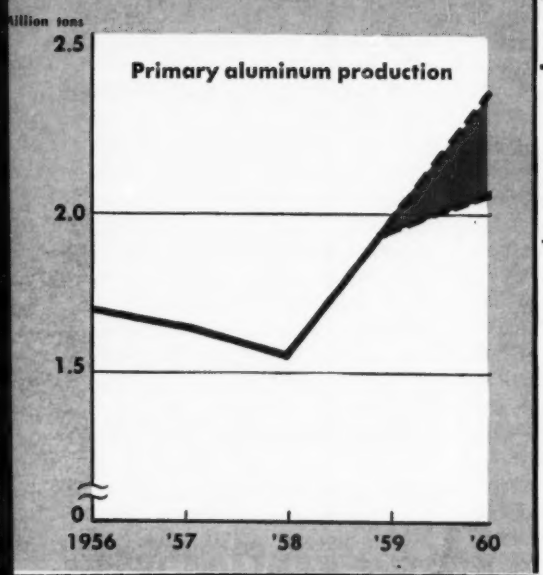
Another Hike? Confidence is so high, in fact, that U.S. producers are already broadly hinting of another price boost in '60. They speak of rising material, capital and research costs. And they stress that last month's price hike did not take into account the labor contracts signed a few days later, which will increase labor costs by something like 30¢/man-hour over the next three years.

Another reason for confidence: imports of semifabricated products from Europe may be easing. Last year, although U.S. imports of crude aluminum remained at about their '58 level (255,322 tons), imports of semifabricated material nearly doubled, to some 50,000 tons. Almost all of this came from western Europe.

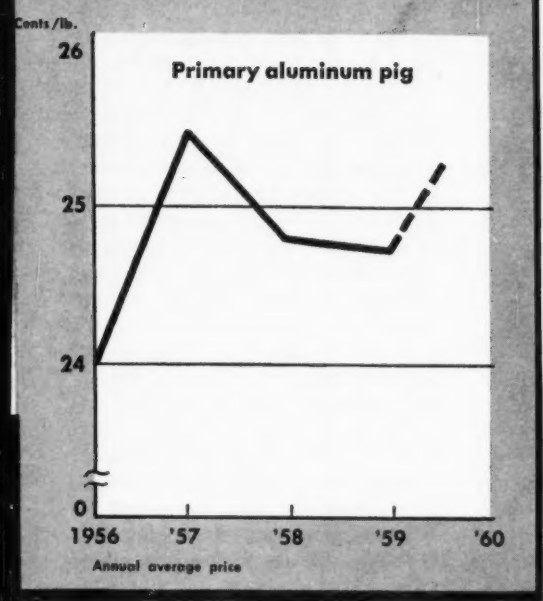
U.S. producers often place much of the blame for their depressed prices on these semifabricated imports. They gain their competitive sting

Brightens Aluminum Outlook

U.S. aluminum output soars . . .



. . . Setting stage for price hike



Overseas Operations of Aluminum Producers

Bauxite mines	*Alumina refineries*	*Aluminum smelters*	*Fabricating plants*
		ALCOA	
Surinam		Surinam*	Venezuela*
Jamaica, B.W.I.		Mexico*	Mexico
Domin. Republic			United Kingdom
			Japan
		ALUMINIUM LTD.	
Brazil	Brazil	Brazil	Brazil†, Uruguay
India	India	India†	India
Brit. Guiana*	Brit. Guiana*	Italy	Mexico†
Jamaica, B.W.I.	Jamaica, B.W.I.	Sweden	Germany
Malaya		Norway	Norway, Netherlands
Sarawak	Japan	Japan	Japan
Guinea†	Guinea*		Switzerland
France			France, Spain
			United Kingdom†
			Australia‡
			New Zealand*
			South Africa, Nigeria*
		REYNOLDS	
Guinea†	Guinea*	United Kingdom	United Kingdom
Jamaica		Australia	Australia
Haiti		Norway	Philippines
British Guiana			Cuba
Ireland			Colombia
Ghana			Mexico
France			
		KAISER	
India*	India*	India*	Spain†
Jamaica		Spain†‡	Argentina*
		OLIN MATHIESON	
Guinea*	Guinea*		
		ORMET	
Surinam			

** Under construction; † Expanding; ‡ Second plant under construction.*

from the low European labor costs and production advantages of Europe's postwar-built plants.

The St. Lawrence Seaway is still causing concern among U.S. producers. This year, they point out, will be its first full season, and the real test of whether the Seaway will funnel in a greater swell of low-priced imports from western Europe.

But the general outlook is optimistic. Europe's aluminum output is rising, but so is its consumption. Already, shipments of scrap to the U.S. have all but stopped, and now U.S. secondary aluminum producers are complaining that they can't get enough scrap to keep their plants in full operation.

There's plenty of room in Europe for aluminum consumption to grow —and take the pressure off the U.S. market. Belgium (which makes no primary aluminum) has been the biggest exporter of semifabricated products to the U.S.—it gets most of its crude aluminum from France. The per-capita consumption of aluminum in the Benelux countries is only 3.4 lbs./year, nearly 23 lbs. in the U.S.

Italy, another big U.S. supplier in the past, has an aluminum consumption of only 5 lbs./person. This year, Montecatini, which produces 50% of Italy's primary aluminum, will build a 10,000-tons/year plant. All of its output, along with Montecatini's other output and that of Italy's two other producers, will be consumed domestically. And neither of Italy's two major exporters of semifabricated aluminum expect to sell any to the U.S. this year.

In France, where aluminum consumption has been rising 12.5% annually, per-capita consumption is still only about 9 lbs./year. And although it has launched the world's first aluminum ship, West Germany's per-capita consumption is still only 10.8 lbs./year.

Stepping Abroad: Besides hoping to cash in directly on the rapid development of overseas aluminum markets, the big North American producers hope to relieve some of the pressure on home markets by setting up shop overseas and pushing greater use of the metal. Overcapacity still characterizes the world aluminum situation; but most of it is in North America.

Aluminium Ltd., for example, has spent close to $1 billion since '50 on expansions, mostly to build up mining, refining and smelting facilities. Now it finds itself facing a worldwide ingot capacity of more than 900,000 tons, and a fabricating capacity of only 400,000 tons. It doesn't aim to completely close the gap (European and U.S. producers take a big chunk of its ingot); but from now on, its expansion stress will be on fabricating plants.

Battle in Britain: The drive by U.S. aluminum companies to integrate themselves into the world market was highlighted last year by the dramatic battle between Alcoa and Reynolds (with Tube Investments Ltd., Reynolds' 51%-partner in Reynolds-T.I. Aluminium Ltd., formed in '57) for control of British Aluminium Ltd., the U.K.'s only ingot producer. Reynolds won, now holds 45% interest in British Aluminium. T.I. has 47%, Reynolds-T.I. 4%, and miscellaneous stockholders have the remaining 4%.

British Aluminium has about 30,000-tons/year ingot capacity, and a fabricating capacity of around 85,000 tons/year, which makes it England's second-largest fabricator. Altogether, it accounts for about 35% of the British aluminum market. It has mines in Ireland and Africa, smelters in Scotland, Norway and Canada, fabricating plants in England, Scotland, Canada and Australia, and sales offices in England, Europe, India, Pakistan, China and Australia.

After it lost the battle for British Aluminium, Alcoa established a foothold in England by setting up Imperial Aluminium Co. (Impalco) with Imperial Chemical Industries (London). The latter holds 51% interest. ICI transferred its 20,000-30,000-tons/year sheet, strip and extrusion plant to Impalco.

Aluminium Ltd. had already established its U.K. outlet through its 100% ownership of Northern Aluminium Ltd., the U.K.'s biggest fabricator.

Virgin Markets: The North American producers see their greatest long-term growth prospects in the less developed countries, where per-capita consumption averages less than 1 lb.

Alcoa has an interest in Alcomex, Mexico City producer of extruded and tube products. And it holds a 35% share of Aluminio, S.A., which is putting up a $20-million, 20-metric tons/year smelter in Veracruz.

With Montecatini and Venezuelan investors, Alcoa is building a $1.8-million tube and extrusion plant in Venezuela.

And it's carrying on "tentative discussions" about setting up an operation in India.

Kaiser is concentrating all of its overseas expansion so far in underdeveloped countries. In Spain, it has a minority share in a 5,000-metric tons/year smelter and in two semifabrication producers, and it is joining with Pechiney and Spanish investors to build a 12,000-metric tons/-year smelter, due to start operations this year.

In India, Kaiser has formed Hindustan Aluminium Corp. with the Birla interests and is building an integrated aluminum project, which will include a mine and a 20,000-metric tons/year reduction plant. It's also investing more than $3 million in Industrias Manufactureras del Alumino, a new joint subsidiary that is building Argentina's largest aluminum fabrication plant. Later, Kaiser is expected to launch other projects in South America.

Groundwork: Along with establishing new world outlets, domestic producers are developing major new supply sources. Olin Mathieson holds a 48½% interest in FRIA, the $135-million bauxite and alumina venture in Guinea. Mining started early in '59, and the alumina plant is slated to start up during the first quarter of this year.

Africa, in fact, is becoming a primary bauxite source for a number of companies. Aluminium Ltd., through its wholly owned French subsidiary, Bauxites du Midi, has been mining bauxite in the Los Islands of Guinea. A new bauxite and alumina project is now under construction, which may take another five years. Aluminium Ltd. will probably take on U.S. partners for the project; it will cost an estimated $155 million.

In Ghana, Kaiser is trying to set up a consortium to build a $140-million reduction plant at the port of Tema, to tie in with the big Volta River hydroelectric project. Initially, bauxite would come from Guinea, until connecting links were built to Ghana's own vast bauxite deposits.

In the Western Hemisphere, Aluminium Ltd. recently started up its new 270,000-tons/year alumina plant

at Ewarton, Jamaica, where it has bauxite mines. And it plans to be producing 245,000 tons/year of alumina by '61 at the bauxite and alumina plant it's building in British Guiana.

Alcoa's $15-million bauxite mine in the Dominican Republic is now reaching full operation after some 14 years in development. Shipments last year totaled 400,000 tons, and output is rising each year.

In Surinam, Alcoa is launching a $150-million project with the government. It will include a hydroelectric plant, a 60,000-tons aluminum smelter near the bauxite mining center of Paranam, and—by '74—an alumina plant.

With these projects under way throughout the world, aluminum producers face a gigantic selling job if they are to use all of this capacity. The producers are confident they will; the big question is, how soon?

More African Ores

More African ores will be shipped to the U.S. for chemical operations as the result of two major transactions last week.

Allied Chemical Corp. has just arranged to acquire a 51% holding in England's Montrose Exploration Co. Ltd. At the same time, Allied has entered into a long-term contract, whereby Montrose — which owns chrome ore deposits and mines in South Africa's Transvaal—will supply chrome ore requirements for the chromium chemicals plant of Allied's Solvay Process Division at Baltimore.

And American Potash & Chemical will be getting additional types of lithium ore from Southern Rhodesia. Bikita Minerals (Private) Ltd.—a mining company in which AP&C is a major stockholder—has purchased a petalite (aluminum lithium silicate) deposit adjacent to its lepidolite (fluoride-containing potassium lithium aluminum silicate) deposit.

AP&C describes the property as a large, high-grade deposit that forms part of the same ore body already being mined by Bikita.

If the Allied-Montrose transaction is ratified by Montrose stockholders, the Montrose shares purchased by Allied will be held by Allied's wholly owned South African subsidiary, Allied Mining South Africa, Ltd.

Merger in the Making

Merger of Industrial Rayon Corp. (Cleveland) and Texas Butadiene & Chemical Corp. (New York) — a move that would create a diversified company with sales volume of more than $100 million/year and manifold possibilities for growth—has been approved by directors of both companies and now is up to IRC stockholders to ratify or reject. Their decision may come by March.

What's behind the proposal can only be guessed at; because of Securities & Exchange Commission regulations, officers of the two parent companies refuse to say what they have in mind for the combined organization. Among the more intriguing speculations:

- That IRC — whose rayon tire cord has been accounting for up to 75% of its sales volume, and whose small-scale production of nylon-6 for carpeting has generated only slender profits at best—is acquiring TB&C to facilitate diversification into other synthetic fibers. For the past few years, IRC has been researching various noncellulosic, polymeric fiber-forming materials; conceivably these studies may have led to schemes for producing established fibers like type 6-6 nylon (using TB&C's butadiene to make the principal intermediate, hexamethylene diamine) or such entirely new fibers as polybutylene (using TB&C-produced butylene).
- That IRC — with nearly $40 million in working capital and an intimate knowledge of the tire industry —is thinking of going into the production of carbon black masterbatch rubber, an SBR rubber that's expected to make considerable headway this year (*CW, Dec. 5, '59, p. 22*). This would provide a probably steady and profitable outlet for much of TB&C's butadiene; and Boston's Godfrey L. Cabot, Inc., could supply the carbon black. Cabot, together with New York investment house Carl M. Loeb, Rhoades & Co., owns 88% of TB&C stock.
- That still other petrochemical plans are incubating, either for a site near TB&C's $30-million plant near Houston, Tex., or for IRC's 1,200-acre tract (on the Ohio River near Point Pleasant, W. Va.).

TB&C's Fennebresque: After five years, back to familiar ground.

The merger plan calls for IRC to acquire TB&C by issuing about 1,675,000 new common shares in exchange for all outstanding TB&C stock. (Cabot and Loeb, Rhoades would thus assume jointly a nearly 42% interest in the combined company; Cleveland's M. A. Hanna Co. —which now owns about 20.6% of IRC common—would have a nearly 11% holding after the merger.)

If the merger goes through, IRC's Hayden Kline will become chairman of the board of directors, and TB&C's John Fennebresque will be president and chief executive officer.

In heading up a leading rayon producer, Fennebresque—who'll be 43 in April—will be returning to familiar ground. He was with Celanese Corp. 11 years, rising to vice-president and director; and served two years on the executive committee of the Rayon and Acetate Yarn Producers Group.

For TB&C, the proposed merger could mean quicker growth, without waiting for retirement of its $27.5-million first-mortgage loan in '63. For IRC—which was stymied late in '58 on its proposed joint venture with Spencer Chemical to produce caprolactam—the move would help shift the company away from its heavy reliance on rayon tire-cord sales. The merger would immediately give IRC the No. 5 spot in the butadiene industry, plus a healthy share in the high-octane aviation gasoline business—along with numerous opportunities for petrochemical expansion.

Tire Firm in Plastics

Dayton Rubber Co. (Dayton, O.) is embarking on an ambitious program aimed at enabling the company to "compete with the top of the heap."

Clowes Christie, president of Dayton, told CHEMICAL WEEK last week that the firm has been competing too long in the minor leagues; to achieve a big-league role, the company will have to step up its operations in various fields. His prescription:

- Push tire sales volume up 600% by '63 from the present $40 million. (Tire production goal for '61: 15,000 tires/day. It will strain Dayton's present capacity to the limit, and it's projected that another plant will have to be built to meet the '63 sales target.)
- Increase emphasis on plastics and chemicals.
- Construct its own stores and warehousing facilities. The company will buy the land, erect the buildings (mainly prefabricated units), sell the property to local investors and then lease it back, thus tieing money up only during the construction and negotiation period. Dayton plans to have wholesale branches completed in 22 areas by '61.
- Get into the fleet business and offer better servicing. (Fruehauf Trailer Co. has been doing Dayton's truck tire selling. Now Dayton plans to make a tire for the trailer firm under the Fruehauf label.)

Plastics Stake: The company is not, of course, starting from scratch in diversification. Already, plastics and chemicals sales account for 30%, tire sales, 40%, and mechanical goods, 30% of the company's business.

The company's interest in plastics, Christie said, is spurred by the expectation that within a decade, plastics will become second only to steel as an industrial material. And further speeding up acceptance of plastics is the current unrest in nationwide steel negotiations. "Manufacturers must turn to other materials to stretch their steel supplies, leaving the door wide open to plastics."

Christie predicted that Dayton Rubber would have total sales in '60 of more than $120 million (compared with $23.5 million in '49). Although big increases are expected in tire and mechanical goods volume, largest gains are expected in plastics—particularly urethanes.

New Research Area: Biggest ace in Dayton's hand, Christie feels, is the urethane tire. Dayton Rubber now is conducting experiments with tires filled with plastic foam; some are already under test on military vehicles. "We are also experimenting on conventional-looking tires made from liquid elastomers poured in a mold."

The company claims its urethane tire to be good for up to 100,000 miles of actual road service. First nonmilitary application of the tire may come as early as next year.

But right now, the retread market, according to Christie, is a very solid part of Dayton's business—one-third of the company's tire sales. This would largely be lost to the company if the urethane tire has enough bounce to put Dayton up with the "bigs." But so far the company isn't worrying. By that time, Dayton expects to be able to absorb the recap loss easily.

Patents on the urethane tire have been applied for, with Christie expressing cautious optimism on his company's chances for priority.

West Coast Product: American Latex Corp. (Hawthorne, Calif.) is the Dayton subsidiary developing and producing the company's urethane products for military and commercial use. Hardman Tool and Engineering (Santa Monica, Calif.), Dayton's most recent acquisition, Christie described as "the nation's leading producer of aircraft seats for jet airliners." And a company formed by Dayton early in '59, Strato-Safety Equipment Corp. (Torrance, Calif.), provides oxygen equipment and hose for jet liners and military aircraft. (In a seven-year expansion program, Dayton has increased manufacturing facilities from four to 12 plants.)

Other recent acquisitions: Cadillac Plastics and Chemical (Detroit). Cadillac recently expanded its plastics warehouse network by acquiring Delta Products' distribution setup.

Dayton Rubber International was formed last summer, he said, to coordinate all Dayton's overseas activities (two manufacturing plants and technical service agreements with nine countries). And Dayton has just formed a joint company with a Dutch firm to sell automotive and industrial products in the European "Common Market," with more licensing agreements and expanded foreign technical service reportedly in the offing.

Besting Atomic Rivals

Two U.S. uranium processors—Mallinckrodt Nuclear Corp. (St. Louis) and Western Nuclear, Inc. (Denver) — have just demonstrated that this country's nuclear industry can compete for world markets.

Up to now, considerable doubt existed on this score. Some industry men felt that U.S. companies would not be able to match operating costs of large-scale producers in Canada and Africa. But last week brought strong evidence to the contrary:

- Mallinckrodt Nuclear — subsidiary of Mallinckrodt Chemical Works —has been chosen to produce and supply uranium for the reactor core of Britain's *H.M.S. Dreadnought*. This is believed to be the first time that uranium metal for a nuclear warship has been supplied by any commercial source.
- Western Nuclear—which operates mines in the Gas Hills area of Wyoming and a mill at Jeffrey City, Wyo.—has been given the job of supplying 2 metric tons of uranium oxide to the Japanese government's Japan Atomic Fuels Corp. The uranium oxide will be used in experimental electrical power reactors.

While Western Nuclear mines and refines the uranium ore to increase the U_3O_8 concentration, Mallinckrodt starts with enriched uranium hexafluoride gas, converts it into metal.

According to Jesse Johnson, director of the Atomic Energy Commission's Division of Raw Materials, U.S. industry's newly proved ability to compete with foreign producers is backed by two factors:

(1) U.S. processors have greatly improved their technology, increased capacity of their mills. In the early days of the atomic era, Johnson points out, typical mill capacity was in the range of 100-200 tons/day; now there are at least nine U.S. mills with capacity of 1,000-4,000-tons/day.

(2) U.S. ores are of much higher grade than most foreign ores. It's estimated that it takes 2½ tons of average-grade Canadian ore to produce as much oxide as can be made from 1 ton of U.S. ore.

Together, these two factors brought the average price of U.S. uranium down to $9.60/lb. in '58, while AEC had to pay an average of $11.15/lb. on its foreign commitments.

COMPANIES

Stauffer Chemical Co. has acquired Plastic Pipe and Tube Division of Anesite Co. (Santa Barbara, Calif.). The pipe production facilities are being moved to Vernon, Calif., to operate as a unit of Stauffer's Molded Products Division.

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Arizona Fertilizer and Chemical Co. (Phoenix) reports purchase of Arical Co. (Blythe, Calif.), producer of insecticides and fertilizers for the Palo Verde Valley of California and the Parker area of Arizona.

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Plastics Corp. of America (Stamford, Conn.) has been acquired by The Richardson Co. (Melrose Park, Ill.), producer of rubber and industrial plastic products.

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Mifflin Chemical Co. and Brown Drug & Chemical Co. (Philadelphia) have merged with McCambridge and McCambridge Co. (Riverdale, Md.). The new firm, to be known as Mifflin, McCambridge Co., will manufacture 1,500 ethical and proprietary drug items.

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American Chemical Co., jointly owned by Richfield Oil Corp. (Los Angeles) and Stauffer Chemical (New York), has established new headquarters in Long Beach, Calif. Offices are on the site of the new petrochemical plant slated to go onstream early this year.

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Bzura Chemical Co. (Keyport, N.J.) says its recent stock issue (representing about $2 million) firmly assures complete financing of the company's citric acid plant at Fieldsboro, N.J. The 17-million-lbs./year plant is scheduled for March '60 completion.

EXPANSION

Manganese: An unnamed "Eastern group" has concluded agreements with Standard Uranium Corp. (Moab, Utah) for supply of rhodonite concentrates to a proposed $6.1-million manganese refinery to be built at one of three sites: Durango or Grand Junction, Colo., or Castle Gate, Utah. The concentrates would be reduced by one of two electrochemical processes now under study, according to Standard Uranium.

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Azelaic, Pelargonic Acids: Emery Industries (Cincinnati) has broken ground for its $6-million ozone oxidation plant for producing azelaic and pelargonic acids. Primary azelaic market: plasticizers for vinyl plastics, with new uses for dibasic azelaic acids developing in resins and polymers. Pelargonic is used chiefly as a modifying acid in resins and polymers.

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Gas and Oil Equipment: Cooper-Bessemer Corp. (Mount Vernon, O.), through its wholly owned subsidiary, Cooper-Bessemer of Canada, will begin manufacturing operations in a plant leased from Canadian National Railways at Stratford, Ont., its fifth manufacturing plant. The company makes heavy equipment for natural gas and oil industries.

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Polyethylene Glycols: Allied Chemical's Nitrogen Division is about to begin production of polyethylene glycols at its Orange, Tex., facility.

FOREIGN

Pharmaceuticals/Brazil: Reheis Co. Inc.'s (Berkeley Heights, N. J.) new subsidiary, Quimica Reheis do Brasil, will go onstream next month. It's located near the Brazilian seaport, Porto Alegre, will supplement a similar operation in Uruguay that provides liver fractions, bile salts and pancreatic substances refined at the firm's Stamford, Conn., plant.

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Citric Acid, Xanthates/Mexico: Three Mexican ventures are under way. Industrias Quimicas de Mexico S.A., Stauffer Chemical Co. affiliate, will build a citric acid plant in central Mexico and a plant at Morelia to produce xanthates. And another citric acid plant is said to be under consideration in Orizaba, Vera Cruz.

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Petrochemicals/West Germany: Under a barter agreement between the Soviet Union and West German interests, several hundred thousand tons of Russian crude oil are to be imported from Russia into Germany for processing into petrochemicals by Scholven-Chemie AG. (Gelsenkirchen). In return: export to Russia of a complete polyethylene plant.

•

Soda Ash/Korea: Loans of up to $5.6 million have been approved by the Development Loan Fund (Washington) for a 40,000-tons/year soda ash plant to be built by Oriental Chemical Industries Co. Ltd. (Samchok, Korea). Also to be produced: 2,500 tons/year of sodium bicarbonate and 5,000 tons/year of calcium chloride, using salt produced in Korea.

•

Investments/Israel: An investment law has been enacted in Israel offering new concessions in depreciation rates and taxes and guarantee of import permits.

•

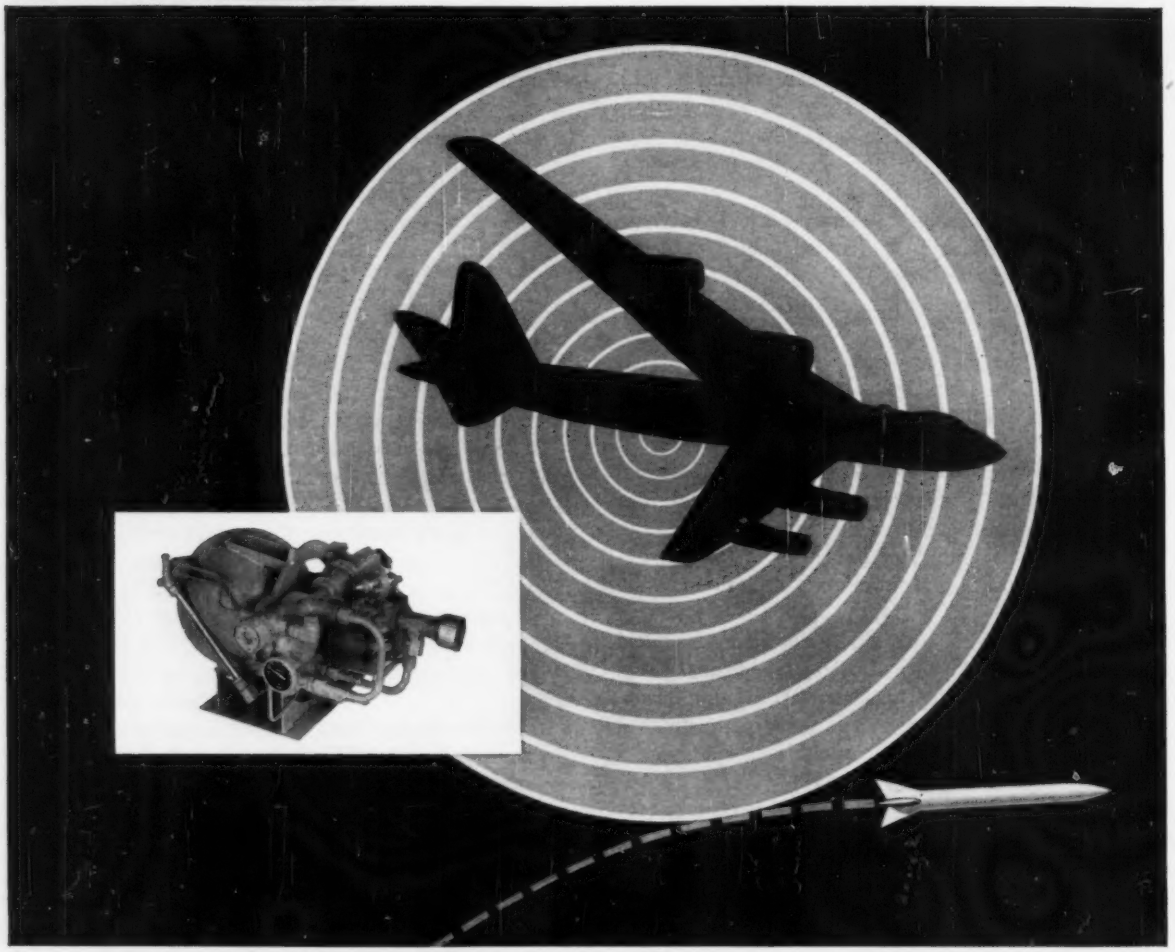
Solvents/England: Imperial Chemical Industries is expanding its solvents plant at Castner-Kellner works (Runcorn). The company expects the expansion, including a new process, to lower production costs, increase the firm's total capacity of trichlorethylene and perchlorethylene by 25%. The $2.8-million expansion is slated for '61 completion.

•

Carbon Black/Pakistan: Pakistan Petroleum Ltd. and Comstock International Methane are planning a 300,000-tons/year carbon black plant in the Sui area.

3M COMPANY CHEMICALS

THE RAW MATERIALS OF PROGRESS



HOW TO HOLD A JAM SESSION 8 MILES UP

Vickers active cooling system (inset) uses FC-75 in countermeasures system

The increasing sophistication of electronic countermeasures systems poses many problems. Among them—how to cool vital components at the environmental and operational extremes encountered in sonic and supersonic aircraft.

For the Sperry countermeasures system, a new airborne active cooling system—capable of dissipating 47KW in a 74-lb. package—was developed by Vickers using 3M Dielectric Coolant FC-75.

This most stable of all fluids offered to electronics has high electric strength of 37KV. It is self-healing, and maintains electric strength after repeated high voltage arcing. It pours at —148°F and boils at 212°F at one atmosphere . . . ideally suited for evaporative cooling.

Compatible with most materials, FC-75 is non-corrosive, non-flammable, non-toxic, non-explosive and odorless. It is thermally stable in excess of 800°F, and will not form sludges or gums under extremely rigorous conditions. These properties make it ideal as a coolant.

Investigate the remarkable properties of 3M inert fluids in terms of your own product design, miniaturization and performance problems. For free literature, write to 3M Chemical Division, Dept. KAK-10, St. Paul 6, Minn.

CHEMICAL DIVISION

MINNESOTA MINING AND MANUFACTURING COMPANY

. . . WHERE RESEARCH IS THE KEY TO TOMORROW

3M COMPANY

Washington
Newsletter

CHEMICAL WEEK
January 2, 1959

Here's what to expect from Congress in the six months of work left before its planned early adjournment to get home and politick.

• Color additives. Developments (cranberries, etc.) since Congress last adjourned have given food and drug matters priority. The Senate has passed a bill allowing FDA to set tolerances for toxic colors; the House will add a "no carcinogens" amendment and pass it. Industry is resigned to the clause, although it considers it technically deficient.

• Labeling of hazardous household substances. Passage is likely of a bill requiring warning labels on household products containing potentially harmful substances. The Senate has held hearings and the Administration backs such action.

• Taxes. The proposed general overhaul will wait until next year; no action is expected except possible elimination of the 4% tax credit for dividends. The expected budget surplus of $2 billion or more may spark an election-year general tax cut, however.

• Minimum wage. An increase to $1.25 is unlikely, but coverage may be extended to some retail workers.

• Labor. If the steel strike resumes, an overhaul of Taft-Hartley settlement procedures will be the hottest subject in town.

• Water pollution. Senate-House conferees will agree on $90 million/year instead of the current $50 million for construction of new municipal sewage units. But a veto is likely.

• Tax incentives for foreign investment. The House Ways & Means Committee will report out a bill to defer taxes on overseas profits until the money is repatriated; this may pass the House but probably not the Senate.

• School construction. The Administration is sounding out Democrats on a compromise but the Democrats consider it inadequate. Result: another stalemate.

• Social Security. Pressure is building fast for the medical care for the aged, to be financed by another ¼% tax on both employer and employee. The Administration's resistance is weakening.

•

The 1960 forecast for fertilizer, copper, and industrial gases from the Business and Defense Services Administration of the Commerce Dept.:

Fertilizer—production and sales will continue at '59's high level, which is 10% ahead of '58, with adequate supplies and little change in foreign trade.

Washington Newsletter

(Continued)

Copper—a 20% increase in copper consumption during '59 over '58's low level will be topped by a 5% increase this year; the effect of '59's strikes in copper production will continue well into '60 but the supply will be ample within six months of the strike settlements.

Industrial gases—last year's 4% gain over '58 will be topped by a 10% increase in shipments in '60.

•

FTC's "conference on public deception" last week cast little new light on the problem:

Generally, FTC tried to impress about 50 representatives of various consumer groups with the need for stepping up their consumer education activities. In turn, the consumer groups said more laws—to require grade labeling by manufacturers, for example—and more money for FTC policing are needed to clean up deceptive practices.

But outside FTC's conference room, the consumer groups got together on a national consumer conference of their own. This conference, to be held in Washington in February, will attempt to "register consumer sentiment" on a host of issues—from deceptive practices to food and drug regulation and television broadcasting. Aim: to achieve political support for new laws and more federal action to protect consumers.

•

FDA will support big drug companies' product superiority claims —claims supported by extensive (and expensive) quality-control checks. Sen. Philip A. Hart (D., Mich.) says that he will ask FDA to comment on the big firms' claims which, in essence, imply that some cheaper drugs sold to the public are inferior.

Here's what FDA Commissioner George P. Larrick will testify: the products of big drug houses are almost always reliable. Small competitors are usually reliable—but not always. A very small human error can make a big difference in the safety or potency of a drug, and small firms do not always test as extensively as they should. One example: it was recently found that 30 small firms were using one commercial lab to do their testing, and the lab was not carrying out the testing the way it claimed to be doing.

Some inferior products got by as a result, though the drug firms could hardly be held responsible for not knowing they were being duped.

•

The drive to fluoridate city water supplies has slowed down. Health, Education & Welfare Dept. reports that the increase in the number of people getting treated water is lagging behind urban growth. Hence, 76 million people are missing the benefits of fluoridated water—3 million more than the number three years ago. In '56, 233 communities adopted fluoridation; this year only 97 did. Medical evidence, says Secretary Arthur S. Flemming, shows that fluoridation reduces dental decay more than 60%.

Take a long look at Jefferson's new polyethers and foam catalysts for the urethane industry

Jefferson Chemical has in commercial production a line of high quality polyethers which you are urged to evaluate in your particular urethane processes. Currently available are reactive intermediates in the molecular weight range of 400 to 3000. In addition, diethylene glycol is available for use in polyester-based flexible foams.

All are made to rigid urethane specifications with emphasis on low unsaturation, low water content, low ash, low acid numbers, and controlled pH. With one or a combination of these Jefferson polyethers in your formulations, desirable resilience, compression set, and compression deflection characteristics can be obtained.

Jefferson is also your best source for commercial quantities of N-methylmorpholine and N-ethylmorpholine which are excellent catalysts for the preparation of flexible, semi-rigid and rigid urethane foams. Still another interesting amine catalyst is N,N′-dimethylpiperazine. It is proving useful as a foam catalyst and is available in developmental quantities.

Make Jefferson your partner in developing better urethane products. For complete technical information and samples of these new reactive intermediates and catalysts . . . contact Jefferson Chemical Company, Inc., 1121 Walker Avenue, P. O. Box 303, Houston 1, Texas.

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JEFFERSON CHEMICALS

For Pittsburgh's Beautiful Gateway Center

LONG LASTING MULTICOLOR LACQUER ENAMEL

Pittsburgh's Golden Triangle—where the Allegheny and Monongahela Rivers join to form the Ohio—has long been one of the nation's leading landmarks. Today the Golden Triangle is changing. New stainless fingers of steel point upward in this truly modern business development.

At Gateway Center—as elsewhere across the nation—multicolor lacquer is the choice for a long-lasting protective coating. Multicolor lacquer is more than a coating—it is a new architectural design tool that combines beauty with functional advantages.

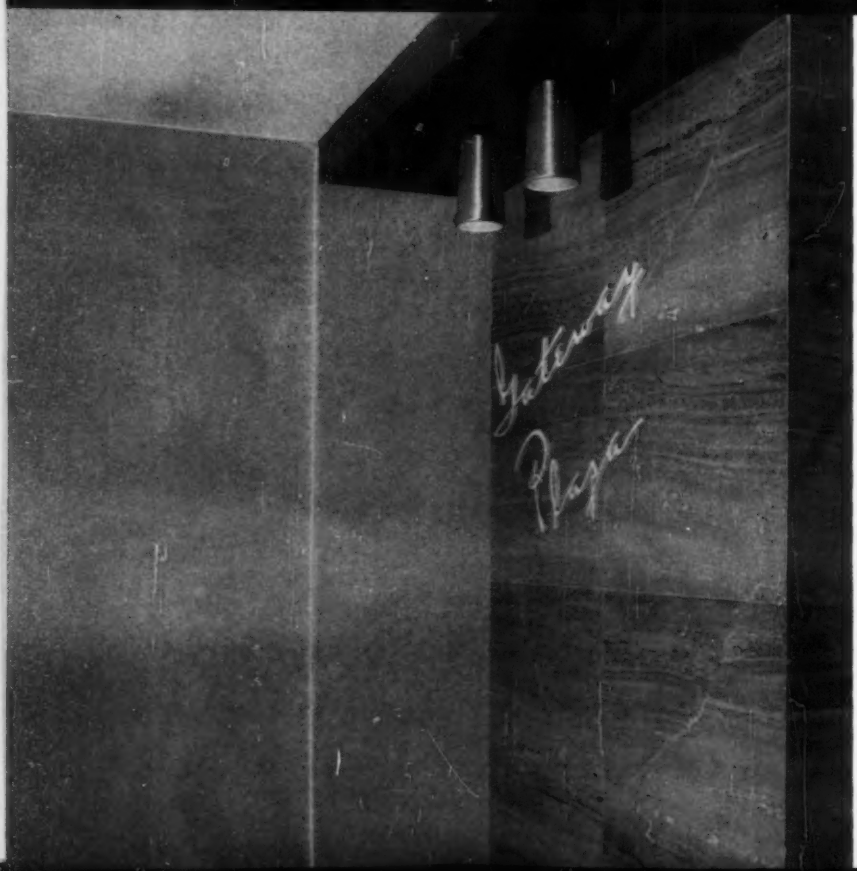
Two or more colors of multicolor lacquer can be sprayed on a surface simultaneously using only normal techniques and equipment. This single finishing coat can be applied to any properly primed surface—plaster, canvas, wood, concrete, wallboard, even most plastics and metals. These different types of surfaces can actually be merged into a smooth, integral area. It's little wonder that architects everywhere are turning to economical multicolor lacquer for a coating that makes the best in design look even better.

Hercules Powder Company does not make finished lacquers or coatings of any kind but it does manufacture nitrocellulose, a basic material used in this multicolor lacquer. If you have difficulty securing adequate information on multicolor lacquer, write us and we shall be glad to assist.

Multicolor lacquer enamel is manufactured under license from Coloramic Coatings, Inc., Los Angeles (U. S. Patent No. 2,591,904).

HERCULES POWDER COMPANY
INCORPORATED
Cellulose Products Department, 900 Market Street, Wilmington 99, Delaware
CHEMICAL MATERIALS FOR INDUSTRY

CL59-13



INVITINGLY COLORFUL

The variety of colorful designs available with multicolor lacquer transfer corridors and stairways into brighter, more inviting space. Officials for Gateway Center report numerous compliments from tenants and visitors alike since the application of multicolor. Appearance combined with long wear make multicolor ideal for commercial buildings.

Multicolor lacquer for this application is Spatter Finish Lacquer, manufactured by Pittsburgh Plate Glass Company.

SYMBOLS OF PROGRESS AND GROWTH

Gateway Center's three stainless steel office buildings adjoin Point State Park at the apex of Pittsburgh's Golden Triangle. Owned and operated by The Equitable Life Assurance Society of the United States, Gateway Center is modern in every way—one of many good reasons why multicolor lacquer coatings were selected for the interior.

STAYS "LIKE NEW"

All main stairways, public corridors and lower level elevator corridors of the Gateway Center are finished with multicolor lacquer. Where the previous coating continually showed dirt and handprints, multicolor remains clean and spotless. On rare occasions when touch-up is needed, new multicolor lacquer blends perfectly and unnoticeably with the existing finish.

CW PHOTO—DOUG KIRKLAND

Aerosols: Fragrance Front-Runners

During the current holiday season, Lanvin Parfums, Inc. (New York), rang up about $5-million sales of a new spray version of its popular scent, Arpege. Lanvin's success with its glamorous black-and-gold flacons —a million units sold in the weeks since its introduction on Nov. 2—illustrates the favorable impact the "name" perfume houses have had on the aerosol business.

Lanvin, and Chanel, Inc. (New York)—which introduced a form of No. 5, in '58—have found that aerosol packaging, newest phase in the mushrooming $110-million cologne and perfume field, is a real profit-maker. In fact, nearly every major perfume house is now readying a spray product for market.

Only seven years ago, aerosol colognes were virtually nonexistent, and the cologne and perfume industry was lazily growing at a rate about even with that of the population. But in '59, $85 million was spent on the spray types, accounting for 77% of the entire fragrance market.

In terms of the aerosol industry, colognes and perfumes account for only 8-9% of total aerosol units produced —but it's about 20% of the industry's current dollar volume.

This phenomenal growth has been a particular boon to many chemical specialties makers, specifically companies providing propellent, valves, essential and synthetic oils, etc.

Enter the Elegant Pouf: Daggett & Ramsdell, Inc. (New York), is usually given credit for marketing the first spray perfume, Gay Manhattan (retail price, $10) in '46. High costs of packaging held sales down and the idea lay dormant until '54, when Carven-Parfums (New York) brought out aerosol cologne versions of Ma Griffe and Robe D'Un Soir. Soon afterward, the sale of aerosol colognes began a spectacular climb, with many of the American houses, such as Max Factor (Hollywood), Avon (New York) and Lentheric (New York), going into the field.

There were several reasons why perfume companies dragged their feet on the sprays. First, the tradition of a fancy glass bottle overshadowed the then relatively unattractive aerosol containers. Also, there were many technical problems in converting a conventional scent formulation into one suitable as an aerosol.

Many perfumers were naturally reluctant to reformulate their products. They feared the scent would be changed, that their product would be incompatible with the propellent, that the aerosol valves would clog, and that the public wouldn't buy.

In '58, Chanel broke the ice for the "French" houses by introducing its famous No. 5 cologne in a chic black-and-gold case, with metered valve (800 measured sprays). It retailed for $5 plus tax. One year later, Chanel started to market a purse-size spray perfume giving 225 applications, also retailing for $5.

Chanel sees its spray products as a complement to its regular line, rather than as a replacement. "The spray also has introduced Chanel to many nonusers," says Henry Calisher, sales manager of Chanel.

Both Chanel and Lanvin cite extensive testing periods before they went into the market. E. L. Cournand, president of Lanvin, told CHEMICAL WEEK that he had been working on the idea of an aerosol for eight years and put his Arpege "mist" through a one-year shelf test before it hit the sales counters. (Arpege mist is more concentrated than a cologne but weaker than a perfume.)

Growth Abroad: Sale of aerosol perfumes in Europe is still in its infancy. (The few sprays on the market are packaged in uncoated bottles.) One of the European pioneers in this field was Marcel Franck, Inc. (Paris), originally a manufacturer of atomizers.

Swiss and German nitrogen was used as propellent in the early stages, but today some companies manufacture fluorinated hydrocarbons (e.g., Du Pont with Freon) in Europe.

Noteworthy: An aerosol spray cologne, Tauentzien, which uses carbon dioxide as propellent, was introduced this month in Germany by Otto Muller GmbH (Berlin).

Many Problems: Today virtually all the technical difficulties in adapting a scent to an aerosol have been overcome. This has been due mainly to the research efforts of the essential oil houses, contract fillers and propellent producers.

Most perfume houses do not manufacture their own scents, but have them custom-made by aromatics firms like van Ameringen-Haebler, Givaudan-Delawanna and Dodge & Olcott (all in New York).

When a perfume company decides to investigate the possibility of an aerosol, it must turn the problem over to its supplier for reformulation. In nearly every case, the product must be completely revised, although the adaptation is said to be easier with the less-expensive scents, which contain fewer substances or less-costly synthetic oils.

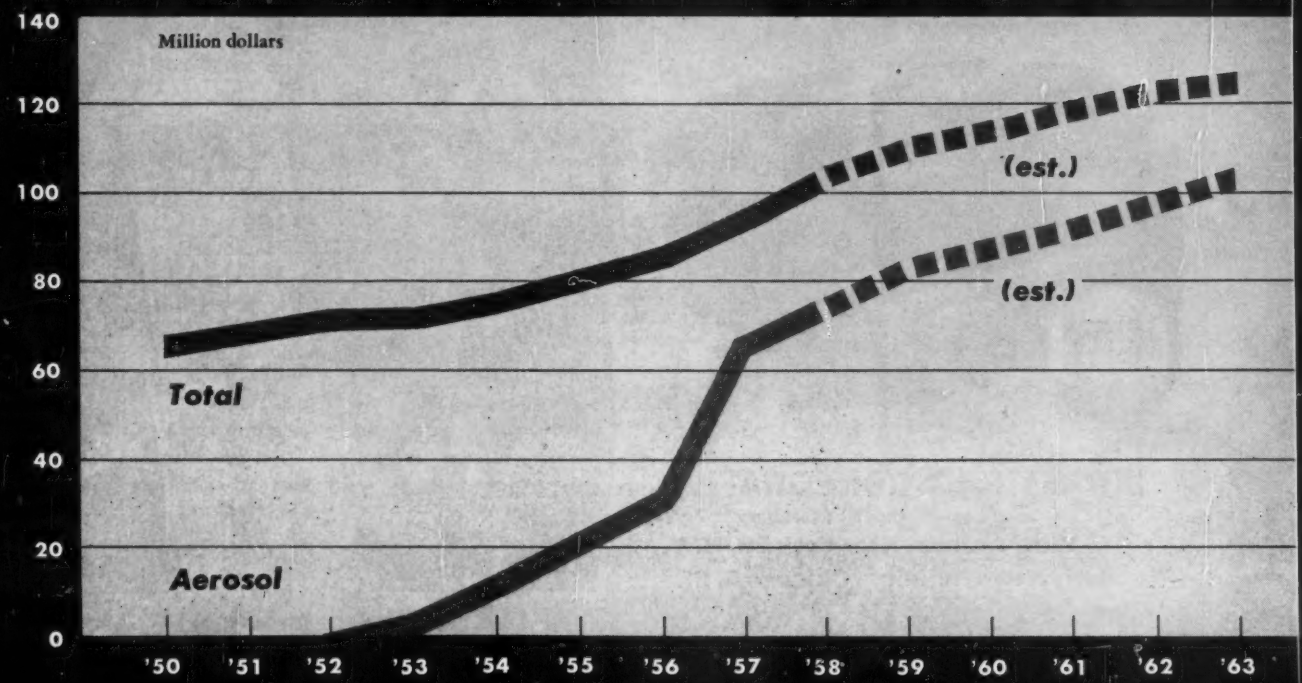
There are 500 natural and 3,000 synthetic oils that may be used in a perfume; a single fragrance may contain 50-100 different substances.

The main packaging problem was compatibility of a product's essential oils with the propellent. For example, many natural oils (e.g., pure rose and jasmin) are not soluble in low-pressure propellent-114 (the most commonly used fluorinated hydrocarbon for sprays of this nature), and neither are some synthetic oils, such as hydroxycitronellal. A perfume formulation suggested by Allied's General Chemical division: 3% concentrate, 47% alcohol, 50% propellent. (For colognes, concentrate is reduced to 1 or 2%.)

Other problems that have been overcome: corrosion of the container (vir-

Stylish flacons are proof that aerosols can be as elegant as traditional bottles

Aerosols capture growing share of U.S. cologne and perfume sales



"It wasn't there last year!"

This is the new 300,000 sq. ft. addition to Kraft Bag Corporation's converting plant at St. Marys, Georgia, scheduled to go "on stream" in February.

Here, in one giant integrated operation, logs from our own forest lands are turned into pulp, then into paper, and finally into heavy duty multiwall shipping sacks, using the most modern machinery and equipment the industry affords.

This expansion of our facilities is one more step in our constant efforts to provide our customers with the best in quality and service.

We invite your inquiries.

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tually all products are now packaged in plastic-coated glass or stainless steel); and odor alteration by the propellent.

Now that the technical bugs have been eliminated, the emphasis is on esthetic appeal. One example: a purse-size metal container developed by Metal Fabrications (Waterbury, Conn.), which eliminates the cap. Perfume is dispensed by pressing the top of the actuator button. Avon is using this unit.

A Hit with the Miss: Extent of consumer acceptance of aerosol colognes and perfumes can be judged from increasing sales figures and the fact that 77% of all fragrances sold are now packaged in aerosols. And some trade sources predict that in five years virtually all colognes and perfumes will be sprays.

The sprays have many advantages: chiefly, ease of application, no danger of spillage. A seldom-mentioned but important factor (since perfumes are luxury items, not money-savers) is that aerosol units prevent fragrance loss better than do conventional glass bottles or mechanical atomizers. The metered valve also helps prevent waste.

Some perfume marketers think it unlikely that aerosols will completely saturate the market. They believe that some women will always prefer glass-bottled perfume for their boudoirs, so they will continue to make a line of conventionally packaged items. Eventually, though, all houses will be forced by marketing rivalry to sell an aerosol line. And with the exception of a few holdouts like Jean Patou (New York), Caron (New York) and Evyan (New York), nearly all houses are now giving in to this marketing pressure. The next entrant may well be Guerlain (New York), said to be ready to market its Shalimar spray this month.

Other firms, such as Lentheric (New York), hint that aerosols are not the ultimate in perfume packaging, that "fickle woman" may, for various reasons, decide on some other type of package. While working on aerosols now, Lentheric is still researching other perfumes, forms and packages.

If the current growth rate of 20-25%/year continues in this field, however, by '63 chemical specialties suppliers can look for at least a $100-million market in which to vend their wares.

Announcing

AICCO-SOL

MAGNESIUM SILICATE

New plant now producing highly adsorptive free-flowing powder

AICCO-SOL is a synthetic form of magnesium silicate with remarkable adsorptive powers, capable of de-odorizing and de-coloring liquids, and preventing caking of powders. It is a fine, white, free-flowing powder with porous structure and high surface-to-volume ratio.

AICCO-SOL is selective in its adsorptive powers, with strong affinity for acidic and polar materials, moisture vapor, gases, and color and odor-forming compounds.

Made in AICCO's new plant . . . an outgrowth of American Industrial Chemical Company's experience as a producer of silica gel, hydro gel, and other silicates. Samples and technical assistance gladly offered.

USES
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- Retaining moisture, perfumes and flavors in powdered products.
- Preventing caking in plastic molding compounds, fertilizers, detergents, tooth powder, feed supplements, etc.
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PROPERTIES OF AICCO-SOL

Density, gm./cc.	2.04
Specific Area	600 sq.m./g.
Refractive Index	1.500-1.515
Pores: Volume	630 ml./g.
Avg. Dia.	33 A°
Distribution	Uniform
pH of 10% slurry	7.5-8.5

Reactions: Water adsorbed; no change in volume.
Weak acids removed by adsorption.
Strong acids dissolve it.
In salts, heavy metal ions displaced.
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Write for data and samples

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Versatile Chemicals from Armour

Armour Cationic Chemicals
as anti-caking agents

Until now, producers of hygroscopic materials have had to use anti-caking agents that work by preferential absorption of moisture. The difficulties in using these agents are many. But new chemicals from Armour chemical laboratories can eliminate your caking problems completely.

After exhaustive lab, pilot and actual plant tests, results indicate that Armour's cationic chemicals are superior to any anti-caking agent now available.

The anti-caking properties of Armour cationics were originally discovered during flotation applications. When the chemicals were used for flotation of sylvite, chemists found that concentrates coated with the cationics did not cake. Research has now proved that the following hygroscopic materials can also be treated successfully.

Single Salts

Sylvite — Sodium Nitrate — Rock Salt — Urea
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15-8-0 — 12-12-0 — 15-8-8

Armacs® Armeens® Armoflos

One pound per ton. In contrast to the large amounts of other anti-caking agents needed for effective results, these Armour cationics work more efficiently, even though they are used in much smaller quantities. In some instances, as little as ¼ lb. is all the Armour chemical needed. This extreme reduction in ratio of agent to product is due to the fact that Armour cationics are capable of producing a monomolecular, hydrophobic surface, instead of working by preferential absorption. Such small quantities of these Armour chemicals will also reduce your storage space and handling problems.

No dusting. Armac, Armeen and Armoflo chemicals are so effective in preventing dust that some are being used exclusively for anti-dusting. This is a major improvement over other anti-caking agents, which may minimize the caking, but create excessive dust in doing so.

Storage and handling at room temperature. These Armour chemicals require very little in the way of special handling. Many stay fluid at 10°C or below. And, you have no concern about degradation at ambient temperatures.

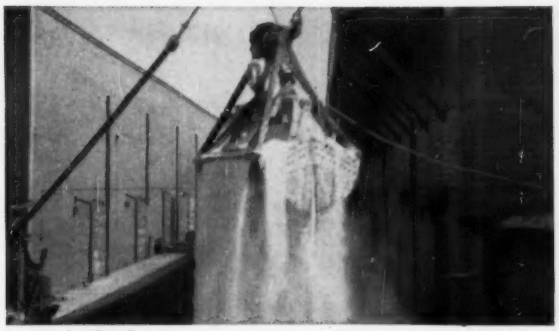
Consistent results. Users are especially pleased with the consistent performance of Armour cationics. There is no perceptible deviation from batch to batch. Uniform free-flow of coated materials is maintained without changing the rate of chemical addition.

Easy application. Armour cationic chemicals present no difficult application problems. Once the point of application is determined, the equipment for feeding the anti-caking formulation is simple, and can be constructed from low-cost materials.

Armour Chemicals and Formulations for Anti-Caking*

Trade Name	Product	Physical State at 25° C	M.P. °C (average)	Method of Addition	Recommended Uses
Armeen® T	Tallow Amine	Soft-solid	46°	As Received	Sylvite Sodium Nitrate Rock Salt Ammonium Sulfate
Armac® T	Tallow Amine Acetate	Pasty-solid	55°	5% Water Solution	Sylvite Sodium Nitrate Ammonium Chloride
Armoflo 610	Formulation (Cationic)	Liquid	8°	As Received	Hygroscopic Salts and Fertilizers
Armoflo 49	Formulation (Cationic)	Liquid	10°	As Received	Hygroscopic Salts and Fertilizers
Armoflo 65	Formulation (Cationic)	Liquid	5°	As Received	Hygroscopic Salts and Fertilizers

*Additional chemicals and data are covered in Armour's new anti-caking booklet offered in the coupon on this page.



. . . complete free-flow

Working to improve products . . . develop new ones

Case History

Following lab and pilot tests, an actual plant test was conducted by a company that manufactures granular fertilizers. The test was conducted on a 17-7-0 fertilizer which set more readily than any other standard fertilizer produced by the company. The set, in the untreated product, was so severe that the cake could not be broken by bouncing the bagged products on the floor.

Granular fertilizer treated with Armoflo (left) and untreated (right).

New Armoflo 49, used at 1 lb. per ton, prevented caking in the product. Results of the test, conducted over a six-month period, were so successful that the manufacturer now insists all his fertilizers be treated with one of the Armour formulations.

If your company works with any hygroscopic material or any product where caking or dusting occurs, one of Armour's cationic chemicals can solve your problem. And, these Armour chemicals work more efficiently and completely for less money.

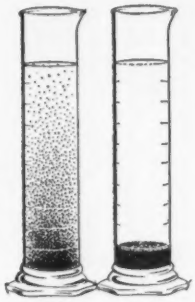
To find out more about these amazing Armour chemicals, and to receive complete information on performance tests and results, use the convenient coupon on this page.

NEW DEVELOPMENTS FROM ARMOUR

Selective Flocculation

Successful lab tests of Armour chemicals, confirmed by field evaluation, have now opened the way for increased efficiency and lowered costs in many flocculation operations. "Selective flocculation" results from the cationic surface activity of the Armour chemicals.

Experiments indicate that these flocculants work exceptionally well on negatively charged surfaces. In many difficult cases, these Armour flocculants are being used to clarify faster, and at much lower costs.



If flocculation is a problem in your operation, Armour will send you samples of these flocculants for your own specific tests. Use the coupon on this page to obtain your samples.

Leader in progressive fatty acid chemistry

Armour Industrial Chemical Company

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Send for information and samples

Please send your new Anti-Caking booklet ☐

Please send information on Armour Flocculants ☐

I would like a sample for anti-caking of _____ (material)

I would like a sample for flocculating of _____ (material)

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CW-1-60

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COCHRANE—159

Pinpointing New Interest in Profit Sharing

Within the next few weeks, as '59 operating figures are totted up, employees of at least 50 chemical process companies will be getting welcome news—notification of their share of company profits. CPI management in '59 turned increasingly to profit-sharing plans to help improve industrial relations; and it now looks as if '60 will show a continuance of this trend.

Although it's not possible to determine the precise number of CPI firms with profit-sharing plans, there's a lot of evidence that chemical firms' interest in the idea is growing.

A. C. Burrows, head of the Council of Profit Sharing Industries (Chicago), points up these developments:

- Increased process firm membership in CPSI (a nonprofit association, currently with 700 companies that now have profit-sharing plans or are otherwise interested in them). This year, the association has 40 CPI members (not all with plans); last year, it had 29. It is taking on new ones at the rate of about one a month.
- Increased participation and interest in CPSI activities and programs by nonmember companies in the chemical industries.
- CPSI has definite information that at least 50 CPI firms—not all members—have profit-sharing plans, and the association believes the total may be 100 firms or more.

Burrows also points to other data that bear out CPSI findings:

- A study by the Internal Revenue Service, just released, showing that in the third quarter of '59 the net gain in industrial profit-sharing plans for the first time exceeded that for pension plans.
- Current discussions in labor negotiations indicate the possible installation of profit sharing to meet union demands to have employees share in productivity gains brought about by automation and changes in work rules.

Profit sharing is used by CPI companies of all sizes. Among those with plans are Abbott Laboratories, Morton Salt, Schering Corp., S. C. Johnson & Son, Detrex Chemicals, Nalco Chemical, Miles Laboratories, and Ansul Chemical Co. Procter & Gamble and Eastman Kodak have had plans for years — P&G since 1887, Eastman since 1902.

Those firms all have plans in the generally accepted definition of the term. The plan (1) is based on profits, (2) applies to all regular employees, (3) is subject to rules of eligibility, (4) is formalized and in writing, (5) is communicated to employees, (6) distributes funds at regular intervals and in an established pattern, (7) provides payments that are above prevailing wages.

Labor Relations Aid: Burrows believes profit sharing may be one way to meet the problems of the growing trend toward industrial automation. Labor is fighting for a greater share in the gains made from automation, is generally demanding higher wages. Most companies are reluctant to admit they've installed profit sharing to quell labor's cries, but privately they agree that such plans can be of value in smoothing labor wrinkles. They prefer to argue that the purpose of profit sharing is loftier, should be looked upon as a device to give employees a feeling of partnership in a common goal with management.

Some companies show reservations about such plans in lean times, point out that most of them are too new to have been given a real test.

Only a few definitive studies have been made of the quantitative results of such plans. Although no CPI firm is known to have made an accounting, CPSI has just finished one study of a company in the metals processing business that may shed light on profit sharing's effectiveness.

The firm under study increased its sales from $407,094 in '45, the year before it took up profit sharing, to $2,156,124 in '55, the last year included in CPSI's study. It was profitably selling at a price 40% below the average price for its kind of products in '45; and through economies it attributes to improved operations afforded by profit sharing, it was able to sell profitably at 48% below the market average of '55. These economies and increased sales boosted net profits before taxes from an index of 100 in '46 to 423.9 in '55 and permitted the employees to share $1,757,204

CPSI's Burrows: 'New profit-sharing plans exceed new pension plans.'

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'Employees need a common goal with management to spur productivity.'

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ADMINISTRATION

during this period, over and above their regular wages. Regular wages were at least equal to community and industry levels during this time.

CHEMICAL WEEK's check of unions in the CPI indicates they're highly skeptical of profit-sharing plans. Reason: they contend that companies either try to defer wages or substitute for them through profit sharing, or are merely using the plans as tax dodges to maximize profits.

CPI management, however, counters that many of the CPI companies with profit-sharing or stock-ownership plans are also considered by unions as strongholds against organization. Procter & Gamble is cited as an example of a profit-sharing company that so far is largely unorganized by unions.

Profit-sharing CPI companies agree that their plans have produced benefits for them, have cut turnover, absenteeism and waste, while productivity and employee relations have improved. Now, as management seeks new measures to change work rules and improve efficiency, they'll be looking harder in '60 at plans embodying the profit-sharing concept.

LABOR

Cutter Back: The 76-day strike by 250 production and maintenance workers at Cutter Laboratories (Berkeley, Calif.) has been settled with signing of a two-year contract with Local 6, International Longshoremen's and Warehousemen's Union. The contract calls for an immediate wage increase of 12½¢/hour, plus 2½¢ beginning March 1, '60; 3½¢ to 4¢ in fringe benefits including an eighth paid holiday. Wages will be subject to an increase in Sept. '60, based on a settlement to be arrived at with distributors represented by ILWU Local 6.

•

Copper Settlement: Another long strike—the 129-day walkout by International Union of Mine, Mill & Smelter Workers against Kennecott Copper Corp.—has been settled. The settlement, applying to locals in Arizona, Utah, Nevada and New Mexico, calls for an increase of 22.3¢/hour for about 6,000 employees. The 22.3¢ comprises an immediate wage increase of 7-10.6¢/hour, plus similar increases in July '60.

LEGAL

Swiss Stake: Interhandel, the Swiss holding company that has been trying since '49 to regain control of General Aniline & Film Corp., may be one step closer to getting that control. It won a moral victory and a legal side issue when the U.S. district court in Washington, D.C., barred by injunction the removal of a redemption provision in Class A stock of GAF. Elimination of the redemption provision had been approved by GAF; it would have removed Interhandel's right to exchange its preferred for common stock.

More than 90% of the GAF stock was seized by the government during World War II, on the ground that it was owned by enemy aliens, on the contention that Interhandel was a front for I. G. Farben. Interhandel denies this and has been litigating the issue for 10 years. A Justice Dept. representative argues that Interhandel's motive in seeking the injunction was to put it in a better position for a settlement with the U.S.

KEY CHANGES

J. Carlton Ward, Jr., to board chairman, **Frank B. Jewett, Jr.,** to president, and **Charles S. Payson** to chairman, executive committee, board of directors, Vitro Corp. of America (New York).

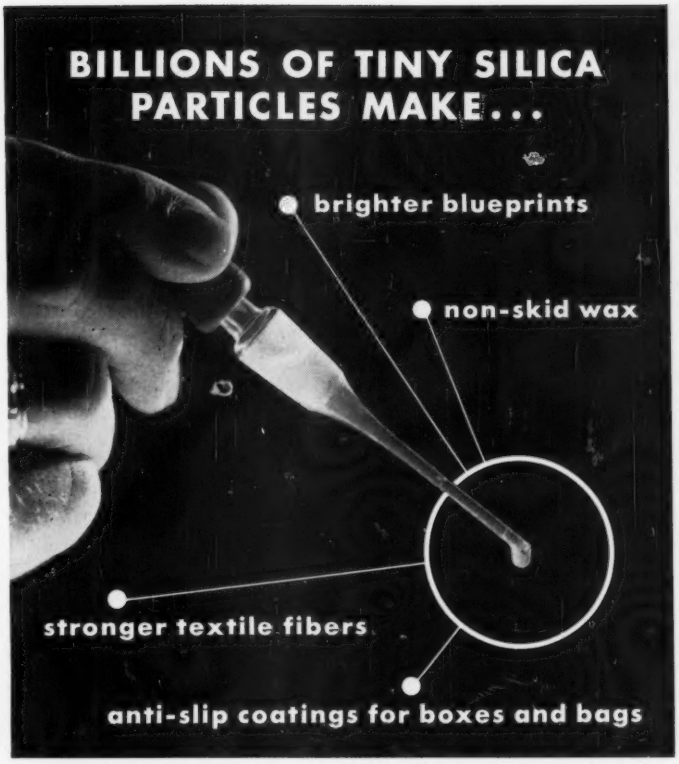
Philip B. Stull to president and board chairman of American Enka Corp., (New York).

A. E. Collins and **L. W. Goudy** to vice-presidents, Vickers Petroleum Co. (Wichita, Kan.).

W. Paul Torrington to executive vice-president, **Russell L. Bauer** to vice-president, manufacturing, and **S. William Kapranos** to vice-president, Latin America operations, all of Mead Johnson & Co. (Evansville, Ind.).

Eugene L. O'Meara, Jr., to president, newly formed refractories firm, Harbison-Carborundum Corp. (Falconer, N.Y.), jointly owned by Harbison-Walker and The Carborundum Co. (Niagara Falls, N.Y.).

G. M. Halsey to vice-president, newly consolidated chemical division, The Glidden Co. (Cleveland).



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Continuous Pulping Takes a New Tack

The swing from batch to continuous pulping takes on new impetus this week, as a novel process starts its shakedown runs in a 3-tons-per-day pilot plant at the University of Florida. Dubbed UFAN—for its patent sharers, the University of Florida and researchers Bruce Armstrong and William Nolan — the process boasts two special features: a system for maintaining chips in a fluid state, and dollar-saving high thermal efficiency.

A variety of continuous digesters have already demonstrated commercially their advantages over batch pulping. They show lower capital cost, lower operating costs, a widened raw-material base, and improved product quality control. UFAN is designed to enhance these advantages by using an unusually low wood-liquor ratio. This not only permits the use of continuous processing equipment but also, in the digester, ensures uniform temperatures, identical cooking conditions for all chips, and a low concentration of chemicals even at the start of the cook.

Brand-New Theory: A new approach to basic wood pulping theory lies behind the UFAN process. Conventional theory, worked out over many years' experience with batch operation, assumes the digesting solution seeps into the wood chips according to laws of osmosis. For this reason, most batch operators soak their chips for about one and one-half hours before injecting steam to bring the mixture up to cooking temperature. This presoaking period was considered necessary to allow the digesting liquor to dilute the lignin compounds around the wood fibers.

After more than 10 years of research on pulping mechanisms, however, Nolan has concluded that "there is no penetration of cooking liquor into the chips ahead of the pulping reaction." Instead, there is a reaction "interface" that proceeds into the chip at a rate depending only on the chemical concentration and temperature of the digesting liquor. Following the interface is a reaction zone, where the lignin concentration varies from near zero at the chip's surface to more than 20% at the interface.

"A clear conception of this moving reaction interface," says Nolan, "will permit a manipulation of the important cooking variables to achieve maximum quality and yield." Continuing on this basis, further research established optimums for chemical concentration, temperature and chip size. It was found that the wood-liquor ratio was unimportant as long as it didn't affect the chemical concentration. And time was a variable controlled by the other conditions.

Ideal State: The Florida work is one case in which operating conditions for a digester system were determined experimentally — the variables, which could be related by a theoretical equation, were controlled and studied one at a time. The results of this research are the sort of information usually considered top secret by pulping mill operators. Nevertheless, Nolan has been quite liberal with data, reports the following optimum conditions:

- Chips should be match-stick size, ⅝ to ⅞ in. long by 1/16 to ⅛ in. in diameter.
- Pulping liquor concentration should be 35 gms./liter of sodium oxide or its equivalent.
- Digesting temperature should be about 365 F, corresponding to a 150-psig. steam pressure.

These conditions require a digesting time of 30-35 minutes for kraft pulps, 30-45 minutes for semichemical pulps, and about 60 minutes for acid sulfite pulps. Studies indicate that resulting pulps will have the unusually high cellulose number of about 1700. (Cellulose number is defined as the number of carbon links in the chain of a cellulose molecule and is an indication of strength. The cellulose number of natural wood is about 2000; some pulping systems produce fibers with numbers as low as 400.)

Practical Results: Although Nolan's research is based on new theory, the experimental results are not startling. Shredding wood chips to match-stick size has become common for continuous digesters. And digester sizes estimated from Nolan's figures are approximately the same, per unit throughput, as those of the Pandia *(CW, May 24, '58, p. 58)* or the Kamyr *(CW, Dec. 28, '57, p. 49)* continuous digesters.

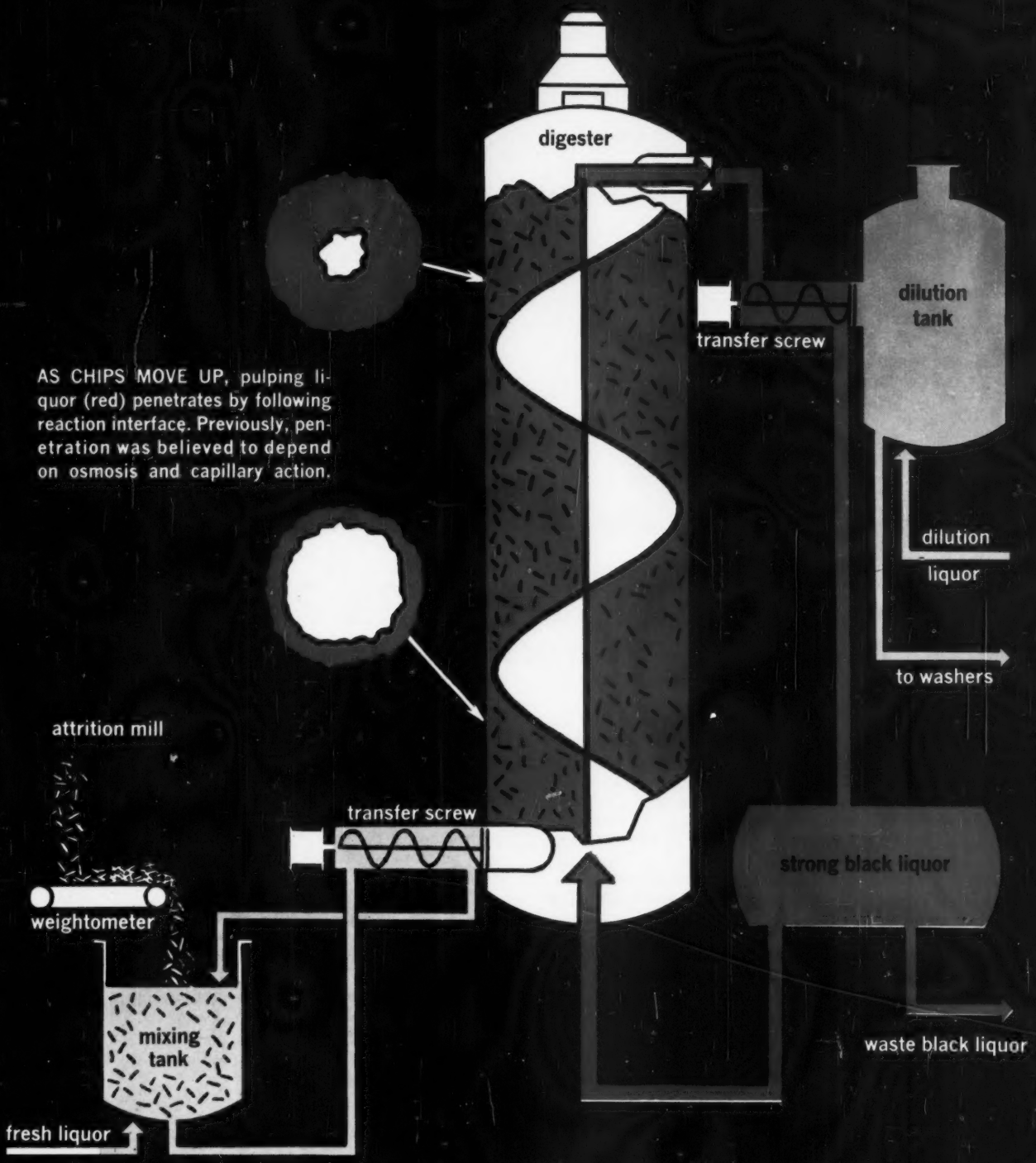
UFAN's key features, fluidity and high thermal efficiency, result from the ingenious application of Nolan's theory. Key point of the theory is that the pulping reaction is independent of the wood-liquor ratio. Thus, UFAN operates as a chain of three recycle liquor links. In each of the links, the wood chips are suspended in pipes and equipment by recycling an excess of liquor. The links are joined by transfer screws, which separate the chips from the liquor and move them into the next link.

The high thermal efficiency is the result of only a small quantity of material, transferred from one recycle link to the next, being heated or cooled. Each link, operating at a different temperature level, is kept at steady temperature by its large mass of liquor. As the wetted chips move from one tank of liquid to the next, they alone change temperature. In contrast, the contents of a batch digester must be heated to the cooking temperature and then cooled again.

The flow diagram *(right)* shows how UFAN operates: wood chips are shredded in a disc refiner, essentially two rotating metal plates with teeth on their opposing faces. Regulated proportions of chips and fresh white pulping liquor are fed to a slurry tank, where they are mixed with a large volume of recycle liquor. This "fluidized" mixture is then pumped at digester pressure to the first transfer screw. Here the chips are separated from the recycle white liquor and fed into a stream of recycled hot black liquor. They move up through the digester and out to the second transfer screw, which separates the pulped chips from the hot black liquor and feeds them into the stream of dilution liquor.

Not all pulpers have been sold on Nolan's theory (he estimates 50% have been convinced). But chances are the progress of UFAN's pilot plant will give the most convincing arguments for continuous-pulping efficiencies and economies.

UFAN digester carries light chip load in recycled liquor



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Technology
Newsletter

CHEMICAL WEEK
January 2, 1960

A new way to grow high-purity, single crystals of refractories has been developed by Stanford Research Institute for the Office of Naval Research. Stanford researchers so far have produced crystals of rutile and magnesium ferrite, ⅜ in. in diameter and 1 in. long. They're now applying the method to growing single crystals of high-purity carbide, nitride and intermetallic compounds.

The technique involves two arc units, face to face, separated by a 45-degree control mirror. This is rotated to direct the light to a vertical elliptical mirror, which, in turn, focuses energy on the crystal. The two arc units are necessary because of the short burning time of arc carbons; it's necessary to provide a steady source for extended periods.

•

Garlic as a potent, safe, bactericide for crops? Peter Ark, professor of plant pathology, and James Thompson, lab technician, at the University of California (Berkeley), found that garlic—long a folk remedy—is an effective killer of many bacteria that ravage fruits, vegetables and nuts. In their tests, they used diluted garlic clove juice, or commercial liquid or powdered garlic extracts.

The team was able to disguise the objectionable odor of garlic with a commercial deodorizing agent, converting it into a pleasantly aromatic preparation. They also found that garlic retains its antibiotic properties for at least three years when stored in a dry place.

•

A plastic transistor "as good" as those made of metals is said to have been developed by Soviet scientist Nikolai Semenov, reports Tass, the U.S.S.R. government news agency. It consists of irradiated polyacrylonitrile, says Tass, and is "as electrically conductive as germanium and silicon." Tass adds: "The plastic semiconductors are more stable than those made of germanium and can be processed more easily."

•

A project to extract elemental sulfur from sulfur dioxide has undergone eight months of pilot operation and has given "encouraging results." That's what Texas Gulf Sulphur and International Nickel of Canada say about their $500,000 operation at Inco's large iron ore recovery project in the Sudbury District of Ontario. The pilot plant, they say, has provided enough data to project costs for a large-scale plant. Feasibility of such a project, however, will also depend on the future price of sulfur.

Elemental sulfur is now extracted, of course, from hydrogen sulfide. And smelter gas sulfur dioxide is used to make sulfuric acid. But there are economic limits to the distance over which either the acid or the dioxide can be shipped. An economic method of removing the sulfur values as elemental sulfur (which could be shipped over longer distances) would open vast new sulfur sources for U.S. industry.

Technology

Newsletter

(Continued)

A new system using fuel cells to harness solar energy will be studied by Lockheed Aircraft Corp.'s Missiles and Space Division (Sunnyvale, Calif.) under a $117,610 research contract awarded last week by the Army Signal Corps. Regenerative fuel cells, in which the current-producing reactants are continuously regenerated, are considered feasible —provided the energy required for regeneration is abundantly available at low cost (*CW, July 25, '59, p. 45*). Goal of Lockheed's 12-month research project will be the development of a regeneration process employing solar energy.

•

A new process for removing strontium-90 from milk has been worked out by two University of Minnesota researchers. Key: animal bone (obtained from stockyards or packing houses), activated by removing fat, treatment with alkali, washing, then pulverizing. In tests using strontium-85, chemically similar but less hazardous than strontium-90, 80% of the strontium was culled from milk passed through the pulverized bone. But higher efficiency of removal is believed possible by the investigators, W. D. Armstrong, head of the physiological chemistry department and Leon Singer, physiological chemist. They report the bone can be cleaned and reused repeatedly.

Says Armstrong, "The amount of fallout at present makes it unnecessary to treat milk for strontium-90. We and the university have applied for a patent on this procedure because we wish to control the use of bone so that it is not illegitimately used for scare advertising."

•

New solid lubricants based on titanium and zirconium sulfides look good in research at the Tribophysics Division of the Commonwealth Scientific and Industrial Research Organization (Melbourne, Australia). They reportedly show "particular promise" as replacements for graphite and molybdenum sulfide. Mechanism of lubrication by the new materials is being studied, after which their economics will be looked into.

•

First commercial output of a new polymeric dialdehyde from starch is under way at Miles Chemical Co.'s Zeeland, Mich., plant. The unit has a 500,000-lbs/year capacity, which can be doubled within 60-90 days, and is expected to drive the price of the one-time $50/lb. laboratory curiosity down to about $1/lb. Miles is shooting for a 30-40¢/lb. price, with multimillion-pound production.

Process key is an electrolytic cell, developed by Charles Mantell at Newark College of Engineering (Newark, N.J.), in which iodine is converted into periodic acid. The process is economical, since the acid can be regenerated cheaply after it has oxidized the starch, says Miles.

Work leading to this improved starch treatment was initiated by the U.S. Dept of Agriculture's Northern Research and Development Division (Peoria, Ill.) to find new markets for starch. Miles adapted the process for commercial use after three years of research. Expected uses of dialdehyde starch: in plastics, wet-strength papers, leather tanning, tobacco binding, protective coatings and some pharmaceuticals.

BRIEFS

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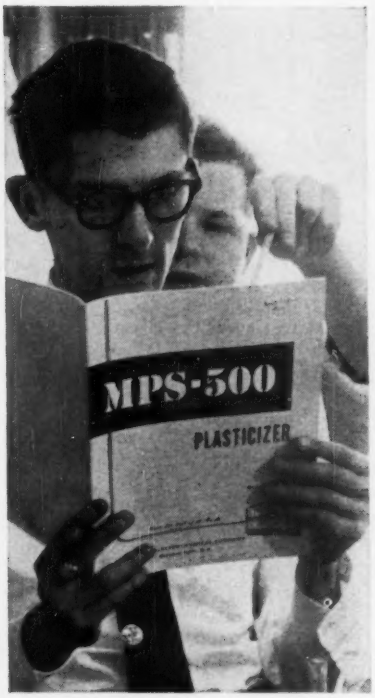

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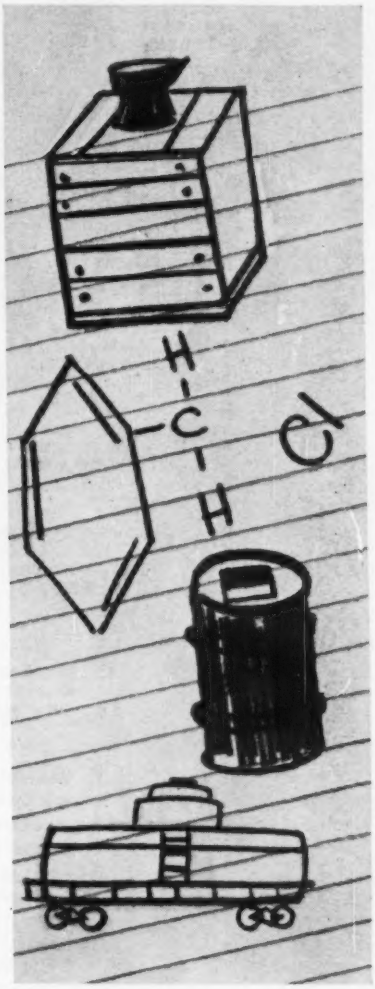

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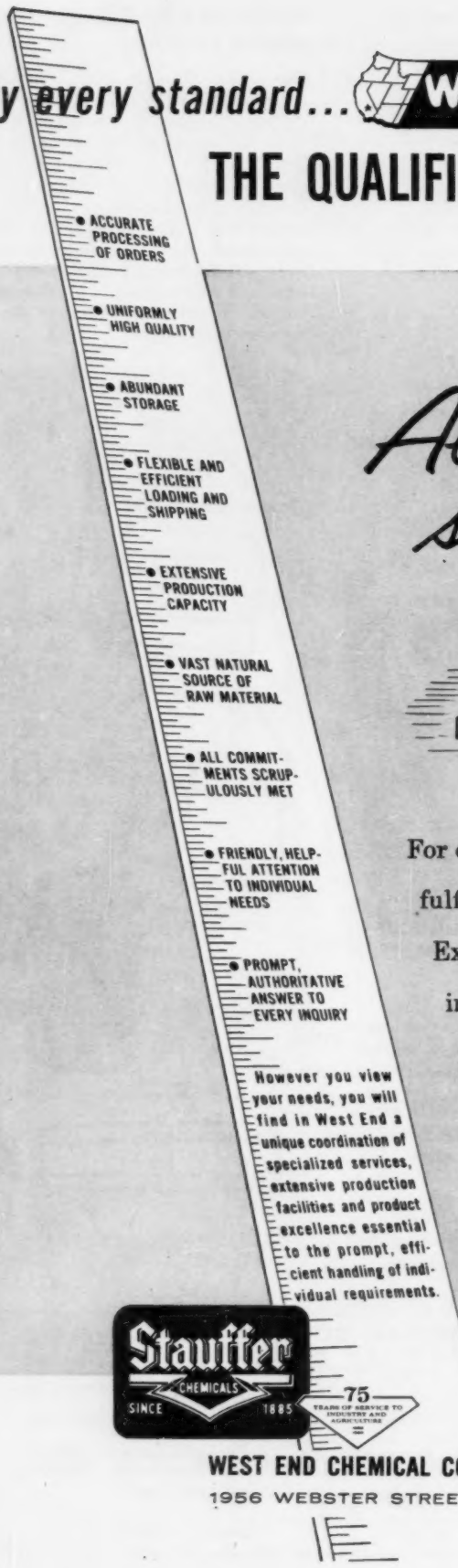
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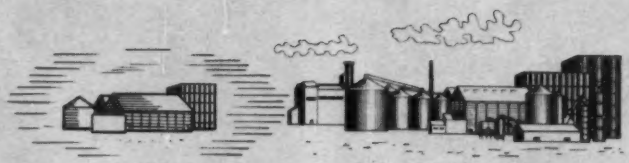

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Changing filter cloth scene

NEW LABELING LAW may cut misrepresentation.

SYNTHETIC FIBERS GAIN on cotton, are tougher.

PRICE CUTTING puts squeeze on research.

RESEARCH LAGS, forcing dependence on plant data.

Now: Better Break for Filter Cloth Buyers

When the new federal textile fibers identity law becomes effective the first week in March, chemical plant management will for the first time be able to tell at a glance just what they're getting when they buy filter cloth. The law will require that fibers, along with the amount used, be stated on the fabrics.

It marks the first real information break for plant management, which has had to depend completely on its own experience and quality-testing, and on the integrity of often fiercely competing sellers, when buying filter cloth.

With no labeling requirements and the wide choice of fabrics available, unethical sellers have been able to offer "bargains," cheating on quality to sell at lower prices.

The new law sets up 15 broad generic fiber classes (a 16th, for fluorocarbons, in the future), will help cloth users sort out the spate of synthetics rapidly gaining acceptance. The synthetics, which had about 10% of the filter cloth market (cotton held the rest) in '56, now claim about 20% on a yardage basis. Some chemical companies report 40% of the cloth they use is synthetic.

Winning Reasons: Harold Luckett, general manager of Syntech Fabricators, Inc. (Passaic, N.J.), gives four reasons for synthetics' increasing popularity over cotton: (1) they last longer, can be wetted and dried often without mildewing; (2) they don't absorb the filtrate—thus fibers don't swell and cut down filtration rate; (3) they withstand higher temperatures (usually up to about 350 F), whereas cotton shrinks at 212 F; (4) they are readily cleaned—again because they don't absorb the material being filtered.

Don Dahlstrom, Eimco's manager of research at its Palatine, Ill., labs, adds that there is less cloth blinding when synthetics are used. When cotton is used, particles of the filtered material sometimes lodge in the cloth, blind the openings and stop filtration. Equipment must then be shut down, and cloths cleaned. Often the cloths must be replaced because cleaning won't dislodge the particles.

Blinding is not as much of a problem in press-type filters as in other kinds; cycles are long, and most filtration takes place in the cake that builds up on the cloth. But synthetics have opened up many new applications for rotary vacuum-type filters because even thin cloths combine high strength with light weight and a tight weave, which helps prevent blinding on the shorter-than-press cycles.

Nylon probably has about half the synthetic market, is preferred for its abrasion resistance. But Calvin Mohr of D. R. Sperry & Co. (Batavia, Ill.) says dynel is the most popular synthetic because of its superior chemical resistance. Teflon fabrics have the best chemical resistance of the synthetics, but Teflon is usually sold on the basis of its high-temperature resistance, says Sperry Ehlers, sales manager of American Machine and Metals' Filtration Fabrics Division (East Moline, Ill.).

Ehlers pegs the olefins as the big research area now, especially fluorocarbons, polypropylene and polyethylene. Dahlstrom points out that a multifilament polyethylene has become available within the last six months. But Mohr feels that polyethylene's low melting and fuse points will keep it out of high-temperature filtration, leave it for the continuous-type filters (e.g., rotary vacuum), where it's best suited. Also under research: polyesters and higher-melting-point acrylics.

No Short Sell: "But don't sell cotton short," says Luckett. And Ehlers agrees, adds: "The granddaddy of all fabrics—the 17.5-oz., 2x2 cotton twill three-ply line—is still the most popular filter cloth."

Reason for cotton's continued use: if the pH of the material filtered is between 5 and 9, and there are no unusual salts present, cotton is probably the best buy. Synthetics usually cost three to five times as much as cotton, on a weight basis. On the

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PRODUCTION

other hand, cotton prices have been rising, bolstering the position of the stronger-than-cotton synthetics, which can be used in lighter weights.

Research Wanted: There are three basic weaves—plain, twill and satin (with some sateen between twill and satin). And there are three basic yarn forms — monofilament, multifilament and spun staple.

Ehlers points out that no one has done comprehensive studies of the effect of the weaves and yarns on filtration.

"Most filter cloth sellers don't even know maximum and minimum pore sizes and pore-size distribution of their cloths—properties that would help us make selections for specific filtration jobs," says an engineer at one chemical company. (Syntech Fabricators is an exception; its monofilament nylon, supplied through the Swiss ties of its parent company, Tobler, Ernst & Traber, Inc., has openings of guaranteed size.)

The dearth of research is mainly due to the complexity of the mechanism of filtration; in filtration (unlike clarification) both the cloth and cake act as filter media.

Slurry characteristics, therefore, are all-important. A slurry compounded in the lab, or transported from plant to lab, cannot have the same characteristics as it has under actual operating conditions.

To mills making cloth, research is uneconomical; filter applications represent only about 1% of cloth sales. And, although some cloth distributors have test labs, they are often too small for basic research studies. Best bets for research are large chemical companies and filtration equipment makers. Equipment makers such as T. Shriver (Harrison, N.J.), Sperry, Eimco, American Machine and Metals, Komline-Sanderson Engineering Corp. (Peapack, N.J.) and Brosites Products Corp. (New York) supply filter cloth, often as a service to buyers of their equipment. National Filter Media Corp. (New Haven, Conn.) has ties with Dorr-Oliver.

The cloth suppliers have a strong incentive for research as a weapon against unethical suppliers and the big mills that generally sell on a large-volume basis. Until basic research picks up, the labeling law will be of substantial help to users of filter cloth.

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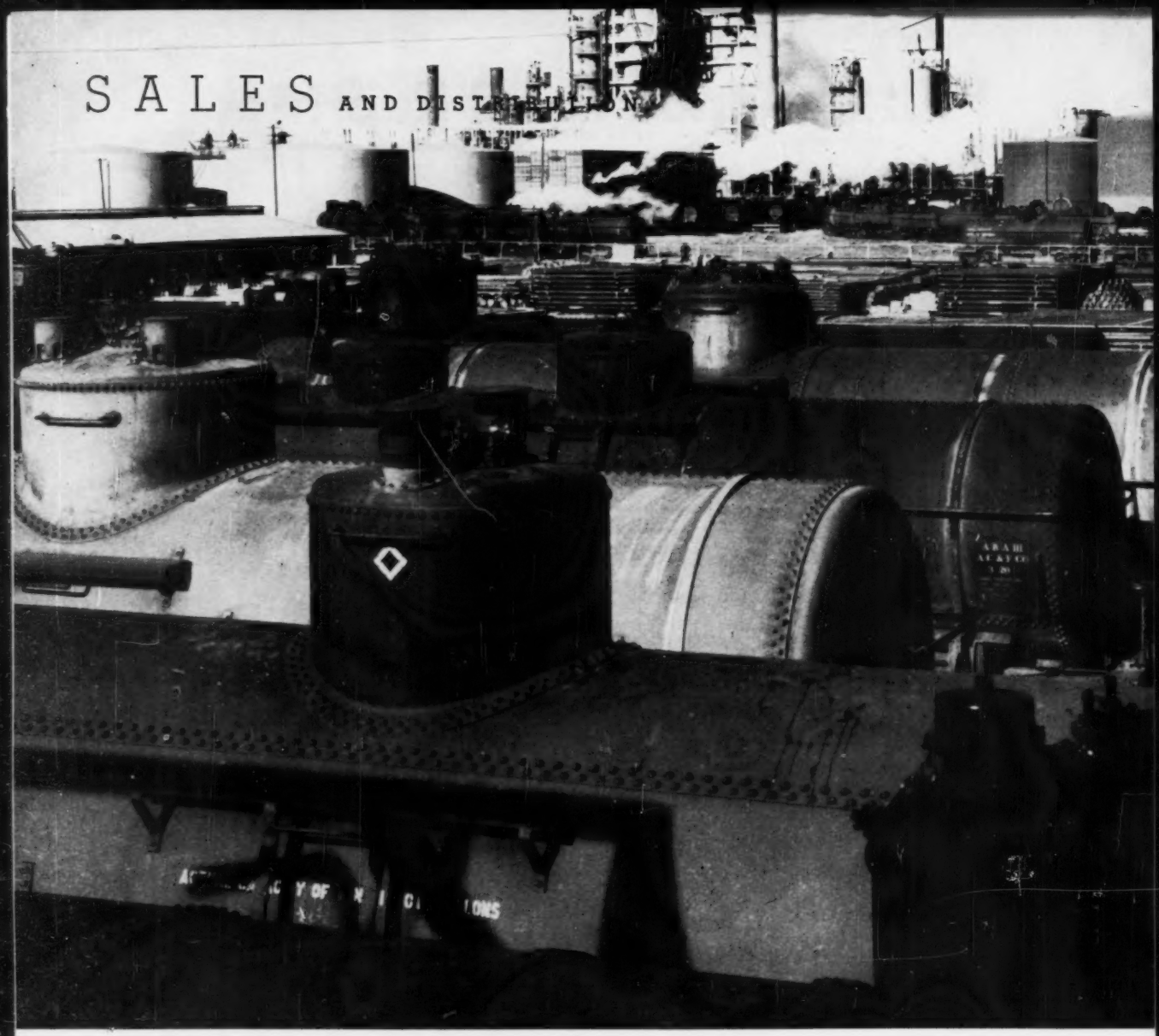


Supply of high-pressure tank cars, tight because of peak LPG shipments, may worsen in '60 —

Tank-Car Dearth to Nip Propylene

Is a scramble for high-pressure tank cars in the offing? The stage has been set for it: increasing shipments of liquefied petroleum gas, burgeoning demand for propylene, and a recession-caused slowdown in new freight car building. This week, industry opinion breaks like this: some chemical traffic experts fear that a serious car shortage looms; on the other hand, car builders contend that there are few new-car orders, that if shippers need cars they will have to initiate orders to get them.

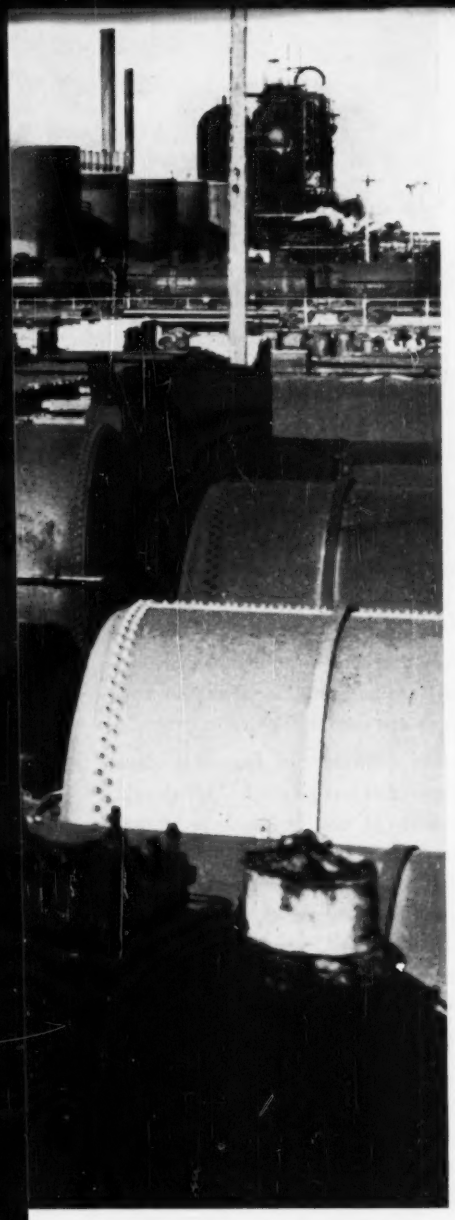
Most immediately affected by the already tight supply of tank cars are shippers of propylene, particularly the high-purity (99+%) grade.

Sinclair Petrochemicals Co. (Marcus Hook, Pa., just south of Philadelphia), only commercial supplier of high-purity propylene, has already been pinched by the shortage. On several occasions, Sinclair reports, it has been forced to ship material in nonregulation cars by special permission of the Interstate Commerce Commission.

Also hit is Petroleum Chemicals Inc. (Lake Charles, La.). PCI's sales manager, David Dyche, told CHEMICAL WEEK that the current shortage has hurt sales of propylene, that the situation is "critical," affecting all types of pressure tank cars.

And Sun Oil Co. (Marcus Hook) —now building a 120-million-lbs./-year high-purity propylene plant near Sinclair's — expects the shortage to become severe.

Purity Poser: Lower grades of propylene (i.e., 90% propylene with 10% propane) usually can be shipped in tank cars rated to withstand pressures of 300 lbs./sq. in. But the high-purity material (necessary for polypropylene manufacture, for example) exerts higher vapor pressures



trouble for propylene shipments?

Growth?

than are allowed by ICC in "300" cars, requires tanks rated for 400 lbs./sq. in.

But here's the bind: only about 800 tank cars in the U.S. have this rating, according to Union Tank Car Co., which owns about 400 of them. And most of these are permanently tied up on the West Coast, where they are needed to carry LP gases safely across hot Western deserts.

Thus, propylene producers lament that they can get, at the most, about 200 tank cars rated for transporting pure propylene.

The tank-truck supply is even tighter. In the entire Middle Atlantic region, where Sinclair now supplies Hercules' Parlin, N.J., polypropylene plant and AviSun's Marcus Hook facility, there are reportedly only four trucks able to carry propylene.

Dissenting Views: But while the dearth of tank cars worries some propylene makers, it by no means has touched all of them. Phillips Chemicals Co. (division of Phillips Petroleum Co.) and Mobil Oil Co. reported they didn't know there was a car shortage. Moreover, they expect no scramble for pressure cars in the near future.

In fact, spokesmen for most car makers said they are not convinced that a shortage exists. They recall reports of many transportation experts early in '59 that a general freight car shortage was brewing, whereas CPI traffic managers actually had few worries on this score last year.

Car makers also discount talk of a car shortage for still another reason: they say the nation already has a large fleet of pressure tank cars—nearly 25,000 tank cars designed and constructed to handle pressures of 300 lbs./sq.in. But most, if not all, of these cars are pressed into service during the busy season for LP gas—October through February. During the remainder of the year, many of these "300" cars, and some "400" models, are released for other uses.

Furthermore, it's no secret that several CPI shippers have managed to ship propylene (high-purity and other grades) in 300-lbs./sq.in. cars under special permit from ICC during winter months. Reason: during cold winter months, lower temperatures minimize the pressure buildup. To date, ICC has approved six applications for such transport.

Few Car Orders: While some specialized cars such as pressure cars are owned by shippers, most are leased from car makers; additional cars are rarely constructed until makers have a lease in hand.

"Sure, there's somewhat of a shortage," quips a spokesman for giant, Chicago-based Union Tank Car Co. "After all, few cars have been built recently, what with the recession, and then the steel strike. Still, nobody's ordering them."

Why aren't CPI shippers placing orders for new cars? Car builders see several reasons—for instance, shippers' use of ICC permits and contemplated use of cars freed from LPG service next spring.

And many companies may be holding off ordering additional 8,000- to 10,000-gal. cars to evaluate the recently introduced 20,000-gal. and 30,000-gal. "jumbo" cars.

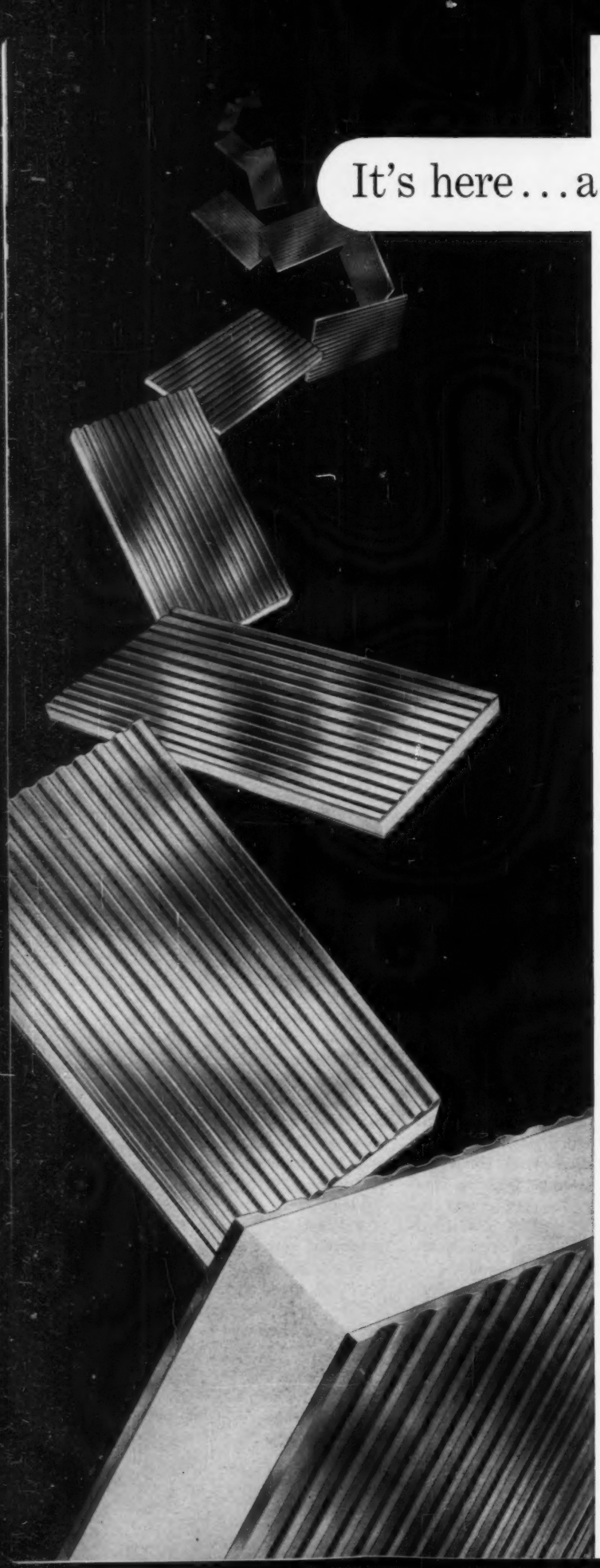
Now that steel inventories are adequate, car builders will soon begin soliciting orders from CPI shippers. They'll be pushing the new "400" cars, plugging their versatility and durability. Most car manufacturers believe the "400" car has far greater potential value than cars rated for lower pressures. In fact, they're granting five-year leases (compared with the usual 10-year deals) with monthly charges only slightly higher than those on older cars.

What's Ahead: Industry observers admit that it's difficult to project their needs for pressure tank cars. Sales of liquefied petroleum gas are moving steadily upward, topped 8.6 billion gal. in '59. And propylene sales—more than 2 billion lbs. in '59, just for chemical processing operations—are climbing rapidly, too. Most significant growth, from the transportation viewpoint, is the mushrooming capacity for producing high-purity propylene. Before spring of '61, plants with more than 300 million lbs. additional capacity will come onstream (*CW Report, Propylene, Nov. 14, '59, p. 53*).

Some observers figure that no severe tank-car shortage will develop as a result of this increased propylene production. Their reasons:

- Some upcoming polypropylene plants will build near propylene facilities, get their material via pipeline.
- Undoubtedly, much of the material will move by barge rather than by tank car.
- Some prospective propylene producers own high-pressure cars.
- Union Tank Car estimates that total '60 production of "400" cars will top 400, help ease the tightness.

But will these cars be enough? It's still too early to say just which way the car supply situation will move in '60. But without additional cars this year, a serious scramble may well develop by '61.



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Market Newsletter

CHEMICAL WEEK
January 2, 1959

Isophthalic acid prices are higher as of Jan. 1. Oronite Chemical has boosted isophthalic tabs by 0.8¢, putting the new quotes at 16¢/lb. for carload lots. The price is f.o.b. Oronite's plant at Richmond, Calif., with freight equalized against the nearest competing U.S. phthalic anhydride producing point. The price action applies only to isophthalic acid; price of phthalic anhydride is unchanged.

The present tight supply of phthalic anhydride, however, gave new impetus to isophthalic use during '59 since some producers have been able to substitute isophthalic for phthalic in their formulations. And Molded Fiber Glass Body Co. recently started trial runs at its new $250,000 plant for making isophthalic-based resins (*CW Market Newsletter, May 9, '59*), has now reached full production.

Capacity of the new plant will be 4-5 million lbs./year of finished polyester resins, which will be about 80% of the current needs of Molded Fiber Glass Body's five affiliated companies. Major outlet for the isophthalic resin is in automotive and boat uses.

•

Will California get one or two new formaldehyde plants in '60? This is the question now being voiced by West Coast marketers, since Hercules revealed plans to build new resin, methanol and formaldehyde facilities at its existing plant in the San Francisco Bay area (*CW Business Newsletter, Dec. 5, '59*). Shortly before this, Borden had been shopping around for a plant site for its own formaldehyde unit.

Latest reports: both Borden and Hercules indicate they will go ahead as planned. Hercules is in the midst of engineering work on its 50-million-lbs./year plant, while Borden has an option on a plant site for a 45-million-lbs./year unit.

Currently, Commercial Solvents has a 30-million-lbs./year plant at Agnew, Calif. Other West Coast formaldehyde units are located in Oregon and Washington.

•

A 12% price reduction on vinyl plasticizer NP-10 has been posted by Eastman Chemical Products. New price of the polymeric plasticizer is 44¢/lb. (tank-car or tank-truck lots)—down from 50¢. A 5½¢ drop (to 46½¢/lb.) on drums delivered in truckload lots and a 5¢ decrease (to 48¢/lb.) on l.c.l lots have also been listed.

•

A better-than-8% growth of plastics production in '60 has been forecast by R. K. Turner, president of Union Carbide Plastics. His figure: 6.2 billion lbs., compared with an estimated 5.4 billion lbs. in '59 and 4.6 billion lbs. in '58.

Among individual plastics, polyethylene is the standout. Turner estimates '60 production of 1.375 billion, up 19% from '59's 1.15 billion

lbs., which was 33% above the '58 total. The "quite unexpected" climb of vinyls into the "billion pounds per year class" ('59 production: 1.05 billion lbs., up 21%) should continue in '60, with a further 14% increase in '61—to a total of about 1.2 billion lbs.

•

The torrid tire-cord price battle continues, as makers of nylon and high-strength Tyrex viscose yarns continue price cuts—apparently with a hope of elbowing the competitive fiber out of the '61 original-equipment tire market.

Allied Chemical's National Aniline Division this week joined Du Pont and Chemstrand in a 7-9¢/lb. cut of nylon prices—and made its prices retroactive to Dec. 23. New prices of various deniers and grades of nylon range from 97¢ to $1.04, in both 6-6 and 6 types.

Rayon producers, meanwhile, cut prices 8-9¢. Beaunit Mills, for example, lowered the price of its 1100-denier yarn—a popular grade—from 62¢ to 57¢. A 5¢/lb. cut was also made in the price of 1650-denier yarn. Other rayon tire-cord producers are following suit.

Where does this leave the rayon-nylon competitive situation? Just about where it was in the first place; the cost to tire producers still stands in approximately the same ratio. But it's believed that rayon makers are closer to hitting the "rock bottom" price level than are nylon cord producers.

•

The list of acrylic raw-materials producers lengthens to four this month, with Dow Badische Chemical Co. on the verge of starting up its plant (estimated 15 million lbs./year) at Freeport, Tex.

The plant, jointly owned by Dow Chemical and BASF Overzee, N.V. (subsidiary of Badische Anilin- & Soda-Fabrik, West Germany), will produce acrylic acid in 94% technical grade and methyl, ethyl, butyl and other acrylic esters.

Other major acrylate producers supplying the fast-growing acrylic emulsion field: Rohm & Haas, Celanese and Union Carbide (*CW, Dec. 19, '59, p. 38*)

•

Is a potash price rise in the cards for July 1, '60? It's being considered by a major producer. U.S. Borax & Chemical's President J. M. Gerstley put it this way in the firm's annual report: "Because of contract provision . . . low prices must continue . . . until June 30, '60, but it is hoped that some price improvement may be obtained at that time."

The firm's potash volume in fiscal year ended Sept. 30 had increased—though the major factor in its 17% sales boost was an increasing demand for various borax-derived chemical products.

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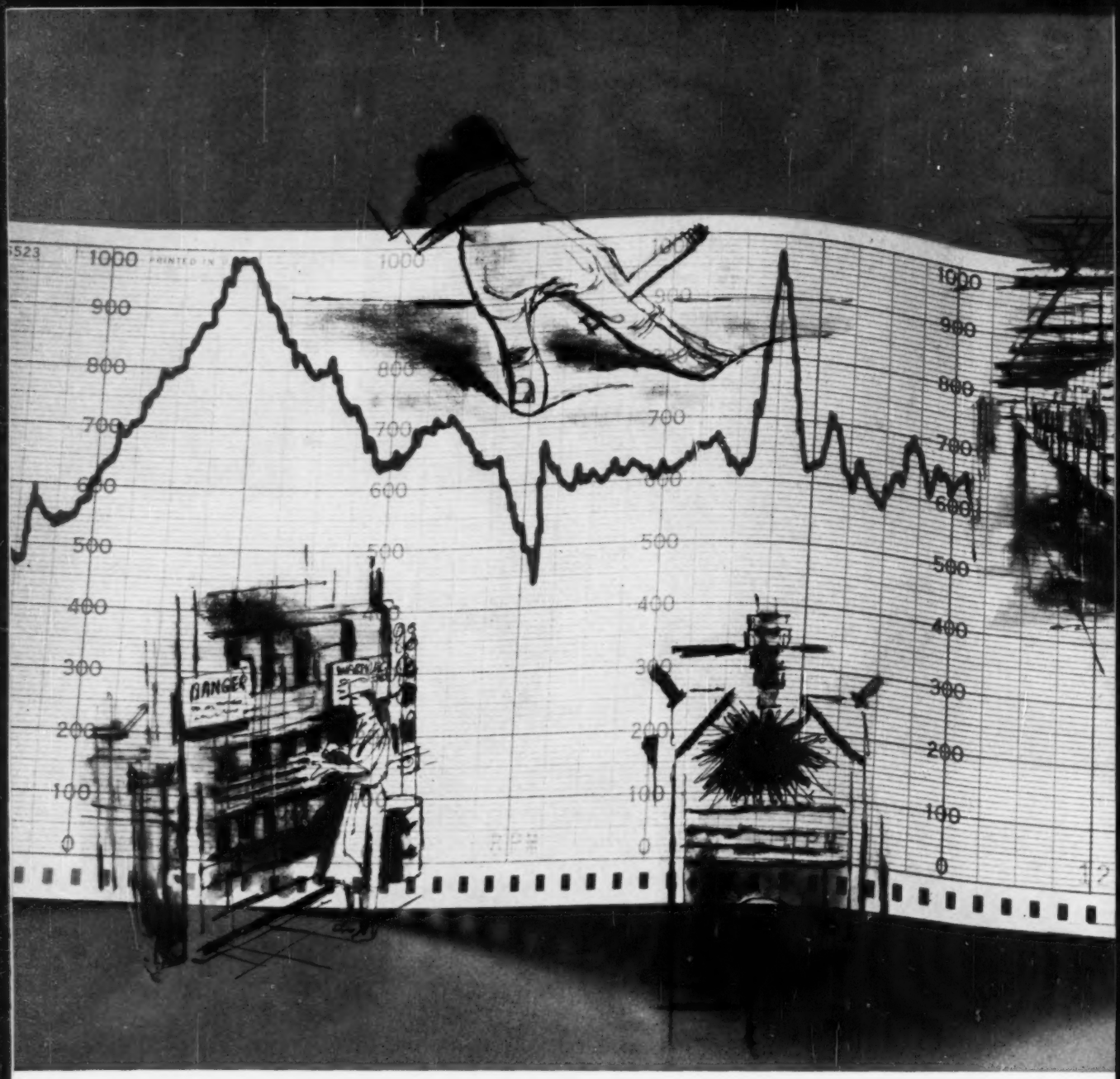

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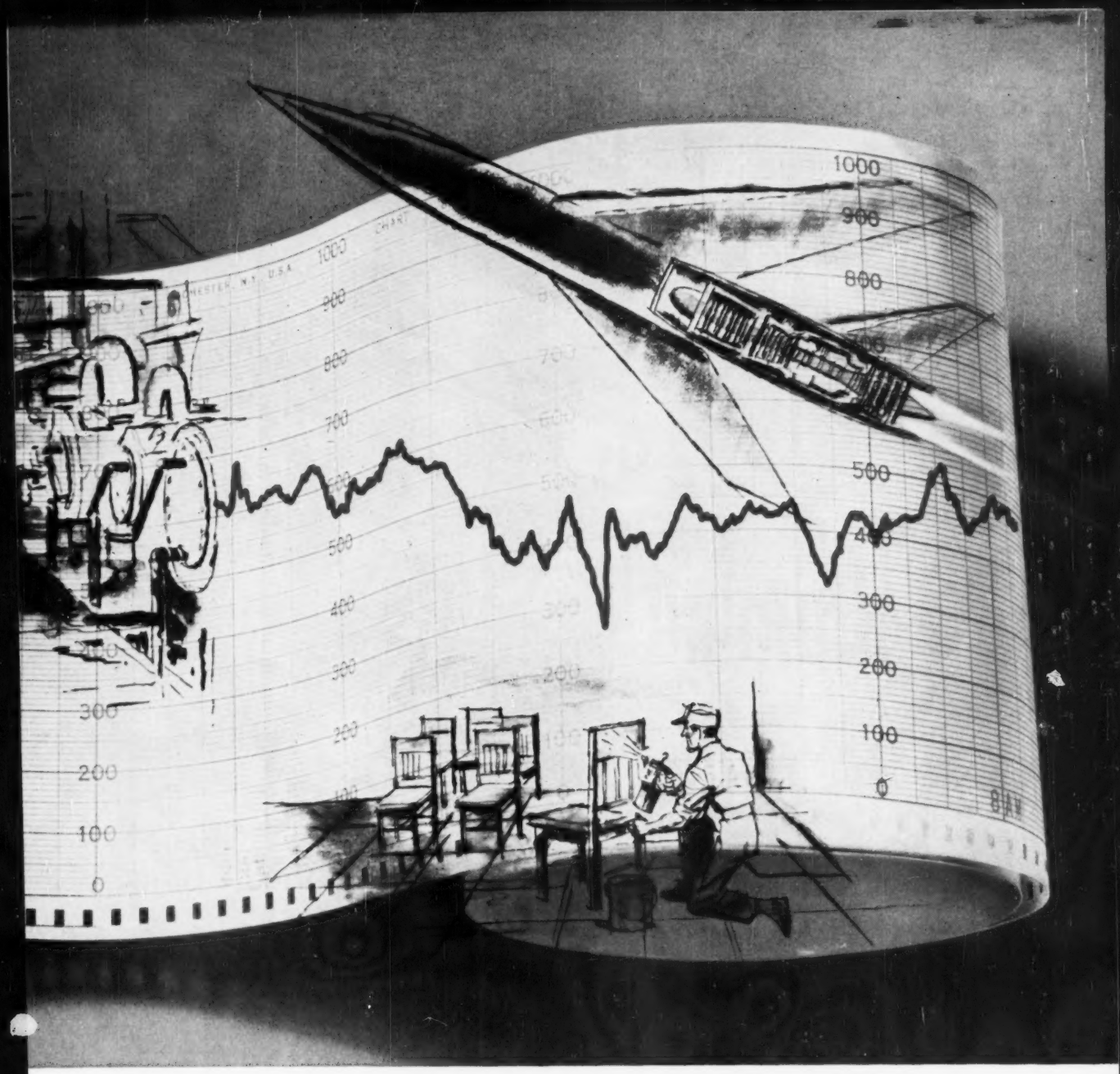

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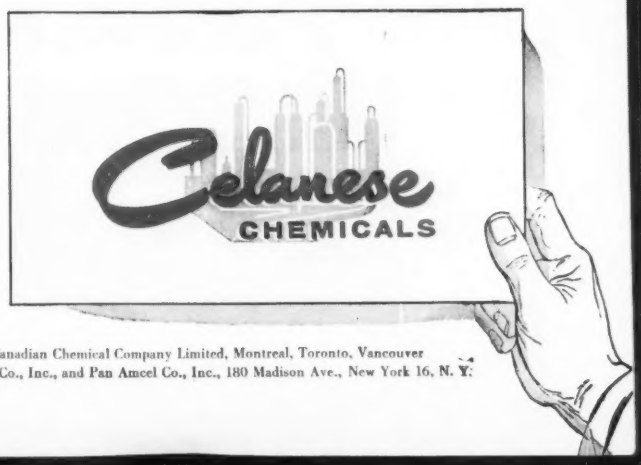

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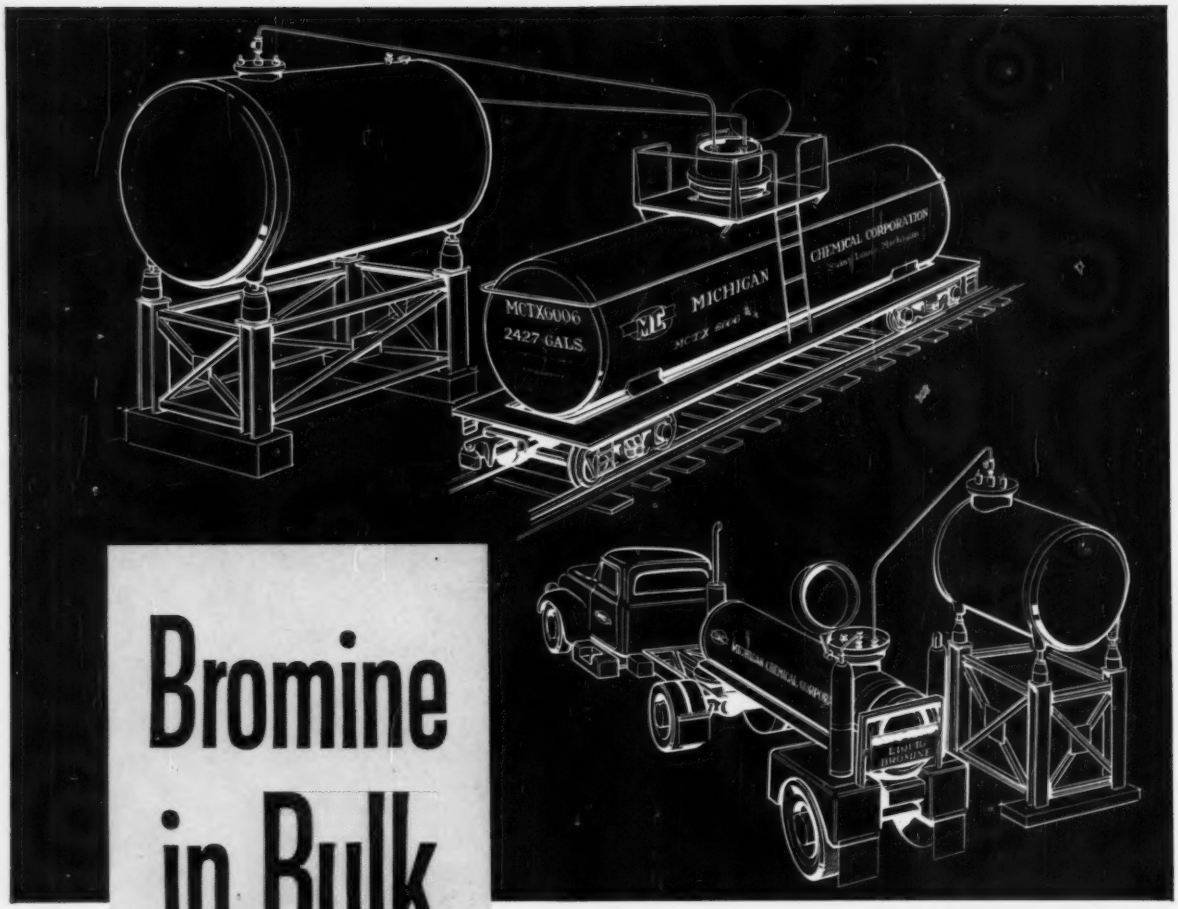

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Pros and Cons of Professional Editors

Research report editors are showing up in more industry and government labs, a CW survey finds this week. But it also shows that a lot of big chemical companies still don't use them, and in pinpointing the reasons why, the survey gives useful ways to judge whether your company could use such editors, and how.

"Technical editors," as they're also frequently called, are used primarily to smooth the grammar and clear up vague spots in reports prepared by lab men. In a few cases, they may also help in the preliminary stages of report writing by guiding in the presentation of data and even in drawing conclusions. Prime gain: lab men are freed for scientific chores. Technical editors usually report to public relations higher-ups.

With some exceptions, CHEMICAL WEEK's survey shows, the private or government lab favors use of the editors. There are about 7,000 technical writers, public information specialists, and the like, in the government. University of California Radiation Laboratories (Berkeley and Livermore), Armour Research Foundation (Chicago), and the government's Bureau of Mines typify research organizations employing editors.

Some industrial labs, such as Tennessee Eastman (Kingsport, Tenn.) and American Cyanamid's Lederle Division (Pearl River, N.Y.), also employ editors. Du Pont, Union Carbide, Allied Chemical and Air Reduction are among firms that do not.

Qualifications and pay scale—apparently through no concerted plan—have been pretty well stabilized. Eastman, for example, has four or five college graduates in this job category, says it will hire more when the work load warrants. UCRL, currently setting up job specifications for its technical editors, now employs eight.

The establishment of clear-cut specifications is something new, although UCRL's experience with such writers goes back more than 15 years, when it used them on a part-time basis. Now its editors are employed full-time; each has at least a B.S. in physics or chemistry (or allied engineering field) and about three years of industrial experience to start; and salary range is $350-800/month, depending on ability, background and education.

And right now, the Civil Service Commission is setting up three sepa-

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* "See our catalog unit in the BUYERS' GUIDE ISSUE for 1959-60".

RESEARCH

rate job classifications for technical writers, technical editors, and technical writer-editors. Starting salary scale will be about $4,000-8,000/year, conforming to the pay grades GS 5-12.

Armour has two girls working only on chemistry section research reports, checking for clarity but avoiding any changes in writing style. Each handles about 15 routine reports each month. Like a lot of other research organizations (*CW, Nov. 22, '58, p. 53*), ARF lets its public relations department help prepare research papers intended for publication.

Editor Enthusiasm: None of the companies surveyed by CHEMICAL WEEK matched the enthusiasm of C. F. Braun & Co. (Alhambra, Calif.), chemical engineering and construction firm, in the use of technical editors. All reports, letters, contracts, proposals, etc., sent out of the company are edited by a special group. Even internal documents are checked if requested. This job was handled by the late president, C. F. Braun, before the company grew so large he was forced to assign the duty. Braun, incidentally, wrote several books on letter and report writing that still guide the firm's technical men.

Few Rewards? One reason such enthusiasm is rare is the dearth of qualified editors—caused, in turn, by the low salaries offered. The Naval Civil Engineering Laboratory (Port Hueneme, Calif.), now looking for a "publications editor (physical sciences and engineering)," will pay either $4,980/year (GS-7 classification) or $5,985/year (GS-9) to qualified applicants, admits it is having a tough time finding one. (One major oil company, also currently looking, tells CHEMICAL WEEK it may have to go to $10,000/year to find the right editor—man or woman.)

However, there are other drawbacks. A disillusioned employee, hired as a technical editor in a major chemical firm, confides, "The job is a dead end for a creative person, leaves no room for initiative, and provides no opportunity for recognition." Few companies deny the truth of this.

No Need? In other cases, companies find no real need for technical editors. Monsanto has held open the title of "technical editor" since '49, but the position is not filled. Several employees help in this capacity as part of their normal duties, and the

firm finds this arrangement satisfactory. Monsanto points out that the job specifications for its research chemists demand that they be able to write reports.

Carbide, Allied and Du Pont concur in expecting researchers to think out and write their own reports. Carbide points out that too much technical matter must be interpreted in a typical report to make lay assistance practical.

Du Pont explains that by the time a report is reviewed by a chemist's superiors—who are thoroughly experienced in report preparation—it's likely to be clear and effective. In the case of papers intended for publication, Du Pont scientists may voluntarily submit drafts to the public relations group for suggestions (not technical editing).

Dow Chemical (Pittsburg, Calif.) notes that a researcher's report output promotes his own professional standing. It does not hire editors, but does supply researchers with secretarial and clerical assistance.

Stauffer Chemical (Richmond, Calif.) also thinks that "captive" writers are unnecessary.

Nevertheless, there's clear indication that the list of technical editors will grow. Some stimulation for growth will likely come as the jobs become more specifically defined, and as increased pay and responsibility are granted. More important, if qualified scientific manpower continues to be scarce, research management is likely to look closer at the role of the writer.

EXPANSION

- The National Bureau of Standards (Washington, D.C.) is expanding its low-temperature research program in an attempt to provide higher-precision thermometry in the 20-90 K range.
- Cargill, Inc., has set up a new biochemical section and a new process development group at its research headquarters in Minneapolis. Object: "to investigate an even wider range of new and different uses for agricultural products."
- E. R. Squibb & Sons, division of Olin Mathieson Chemical Corp., has opened a new $1-million cancer research facility at New Brunswick, N.J. It's exclusively for pilot-plant production of experimental anticancer steroid compounds.

Tracers

TO THE CHEMICAL PROCESS INDUSTRIES

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CHEMICALS WANTED

Surplus and dead inventory wanted. We pay top dollar for unwanted chemicals and chemical products, waxes, spent catalysts, metal sludges, wasted solvents and gas cylinders. Industrial By-Products & Surplus Co., 40-40 Lawrence Street, Flushing 54, New York INdependence 1-4100.

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MISCELLANEOUS

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OPPORTUNITIES

business; personal or personnel; financial; equipment; etc., may be offered or located through the classified advertising section of CHEMICAL WEEK. For more information, write to: CLASSIFIED ADVERTISING DIVISION P.O. Box 12 New York 36, New York.

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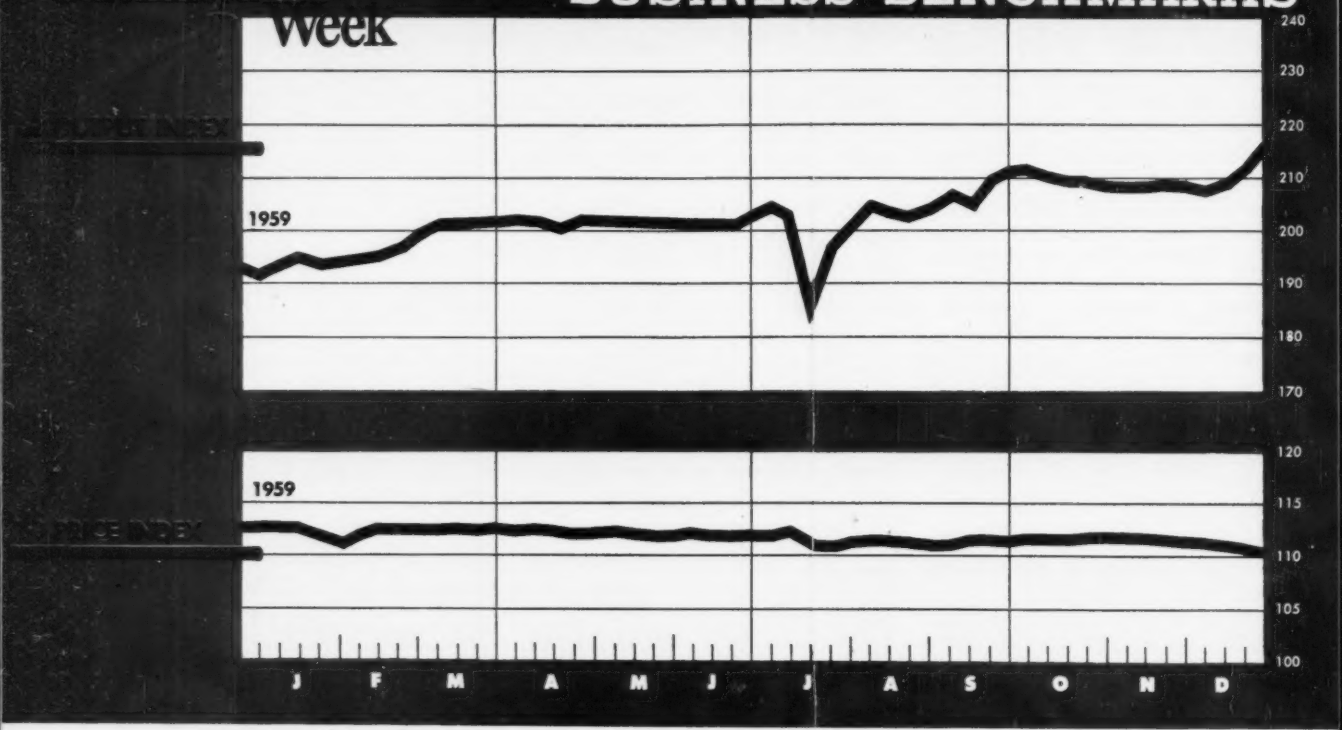

JANUARY 2, 1960

WEEKLY BUSINESS INDICATORS	*Latest Week*	*Preceding Week*	*Year Ago*
Chemical Week output index (1947-1949=100)	216.5	215.0	191.0
Chemical Week wholesale price index (1947=100)	110.9	110.8	111.9
Steel ingot output (thousand tons)	2,636	2,726	1,840
Electric power (million kilowatt-hours)	14,150	14,167	13,534
Crude oil and condensate (daily av., thousand bbls.)	7,139	7,123	7,097

PRODUCTION INDICATORS (1947-49=100)	*Latest Month*	*Preceding Month*	*Year Ago*
All manufacturing	153	156	146
Nondurable goods manufacturing	147	151	138
Durable goods manufacturing	158	160	155
Chemicals and allied products	217	215	195
Industrial chemicals	247	247	211
Petroleum and coal products	144	131	140

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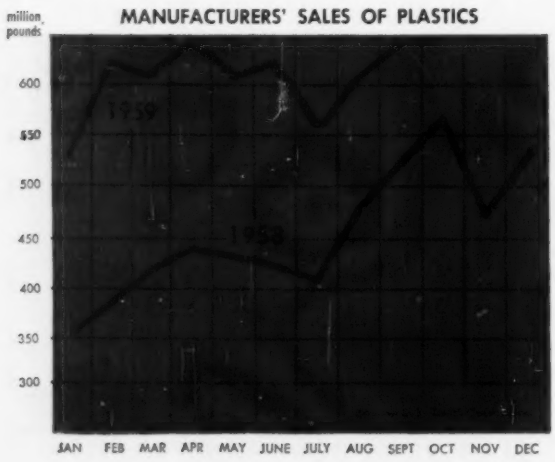

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Cab-o-sil — Cabot's unique "flame-processed" silica* — offers unique advantages to the paint formulator. Used as a flatting agent, its exceptional purity (99.7%), enormous surface area (200 m²/gm.), extreme ease of dispersion, and minimum particle agglomeration combine to be useful in paints, varnishes, lacquers, and plastics.

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We invite you to use the coupon below.

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- **Thixotropic, thickening, gelling agent** — lubricating oils, greases, polyester resins, epoxy resins, plastisols, plastigels, organosols
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- **Reinforcing agent** — rubber, silicone, latex film
- **Anticaking agent** — sulfur, insecticides
- **Antislip agent**—solvent-base floor waxes
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( ) Cab-o-sil in Butyl Rubber (#crub-2)
( ) Cab-o-sil in Dipped Latex Films (#crub-3)
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White carton makes a beautiful picture

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That's why the shipping carton is becoming more than just a container to carry the goods to market. In sparkling white, it attracts attention in shipment—and at the end of the line where sales are made.

It takes proper increase of TITANOX® white titanium dioxide pigment in coatings and liners to obliterate drabness and truly present the new look that affords sharp contrast for merchandising messages.

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